Master's Thesis of Public Administration

Measuring the Influence of the Catholic Faith on the Birthrate of the Lower Economic Class of Guatemalan Society

Case Study of National Hospitals in Guatemala City

천주교 신앙이 과테말라 사회의 저소득층의 출생률에 미치는 영향을 측정하기

과테말라시의 국립병원 사례연구

February 2017

Graduate School of Public Administration
Seoul National University
Public Administration Major

Josué Roberto Castañeda Eguizabal

Measuring the Influence of the Catholic Faith on the Birthrate of the Lower Economic Class of Guatemalan Society

Case Study of National Hospitals in Guatemala City

Kim, Soon Eun

Submitting a master's thesis of Public Administration

September 2016

Graduate School of Public Administration
Seoul National University
Public Administration Major

Josué Roberto Castañeda Eguizabal

Confirming the master's thesis written by
Josué Roberto Castañeda Eguizabal

December 2016

Chair	Jörg Michael Dostal	(Seal)
Vice Chair	Ko, Kil Kon	(Seal)
Examiner	Kim, Soon Eun	(Seal)

ABSTRACT

Measuring the Influence of the Catholic Faith on the Birthrate of the Lower Economic Class of Guatemalan Society

Case Study of National Hospitals in Guatemala City

Josué Roberto Castañeda Eguizabal

Public Administration Major

The Graduate School of Public Administration

Seoul National University

In the global level, it is possible to observe a relationship between national development levels and fertility rates. For the most part, the more developed a country is the lower fertility rate it experiences. In addition to this linkage, there is an optimal fertility rate, socially known as replacement level, desirable for the proper and sustainable development of a nation.

Due to the socio-economic importance of an adequate fertility rate, the present work starts by presenting what it is, its importance, and general considerations on main related factors. Among them, contraceptive prevalence, the number of women in reproductive age (15-49) who are married or in an union and who are currently using a method of contraception, is the closest factor, being especially important as the most efficient and widely available control tool.

Contraceptive prevalence levels corresponding to several countries are presented, showing the contrasting difference between the 54 percent in Guatemala and the average 79 percent in its neighboring Central American countries. Therefore, besides contextualizing this phenomenon, main underlying factors, according to theory, are considered, discussed and selected to be tested against empirical data gathered in Guatemala City.

Contrary to normal studies conducted in developed countries, whose main goal is determining main factors that contribute to the boost of fertility rates, the present work focuses on lowering them.

Due to more than 500 years of strong Catholic influence in Guatemala, unlike to previous studies, the present work regards the Catholic faith as a key underlying factor in the individual level, not in the group level where it is usually considered just to illustrate Guatemalan society as a whole.

Questionnaires considering quantitative and qualitative factors were administered to over 200 pregnant women in different public hospitals of Guatemala City. Based on the collected data, which included information about religion and other normal socio-economic variables, two composite variables were constructed: a *religion composite* variable and a *social composite* variable.

Neither *religion*, a categorical variable comprising the values: catholic, protestant and atheist, nor any of the two composite variables could statistically explain contraceptive prevalence in the sample. Unexpectedly, *age* and *working status* turned out being the best explanatory variables with high levels of significance.

After presenting, comparing, and statistically analyzing the empirical data, the demographics of the results were satisfactorily compared against official data provided, among others, by the Guatemalan National Institute of Statistics. The main findings were contrasted against mainstream theories, among which, *rational theory* and *gender equity* turned out being in harmony with them.

The fact that *religion* was unable to explain contraceptive prevalence is finally discussed and the implementation of a second similar research is recommended but in the rural countryside of Guatemala, given the notorious differences between the relatively highly developed capital city and the remote regions of the country.

Keywords: Guatemala, Fertility Rate, Contraceptive Prevalence, Catholic Church, Contraceptive Methods, Development.

Student Number: 2012-22740

TABLE OF CONTENTS

Abstract i

Table of Contents iv

List of Tables vi

List of Figures vii

List of Acronyms vii

Chapter 1: Introduction 1

1.1 Research Background 2

1.2 Objective of the Study 3

1.3 Research Question 3

Additional Questions 4

1.4 Significance 4

1.5 Thesis Structure 6

Chapter 2: Literature Review 7

2.1 Development and Fertility Rate 7

2.2 Total Fertility Rate Facts 8

2.3 Fertility Rate Theories 11

2.4 Contraceptive Prevalence 17

2.5 The Case of Guatemala 19

2.6 Major Policies and Events 23

Chapter 3: Research Methodology 26

3.1 Research Design 27

3.2 Population and Sampling 32

3.3 Data Collection 35

Sections and Items of the Questionnaire 36
3.4 Data Analysis 40
3.5 Delimitation 40
3.6 Validity and Reliability 41
Chapter 4: Results and data analysis 43
4.1 Filtering the data 44
4.2 Demographics of the Data 45
4.3 General Analysis 50
4.3.1 Analysis of Coherence 50
4.3.2 Correlations using the Exogenous Variables 51
4.3.3 Correlations of Endogenous Variables 55
4.3.4 Catholic faith 56
4.3.5 More Composites Variables 59
4.3.6 Defining the model 62
Chapter 5: Conclusive Discussion 67
5.1 Theory and Demographics 67
5.2 Theory and Findings 69
5.3 Summary of Relevant Factors 76
5.4 Recommendations 78
References 79
Appendices 83
Appendix A 83
Appendix B 85
Appendix C 87
Appendix D 94

LIST OF TABLES

Table 1. Total Fertility Rates in EU countries, 1960-1995 13
Table 2. Contraception Prevalence by group of countries. 19
Table 3. Contraceptive prevalence underlying factors 28
Table 4. Explanatory Variables 30
Table 5. Items and their function, classified by group 39
Table 6. Hospitals where questionnaires were administered 43
Table 7. Respondents' schooling level 47
Table 8. Respondents' working status 49
Table 9. Weak exogenous variables 52
Table 10. Strong exogenous variables 54
Table 11. Correlations between endogenous variables 55
Table 12. B values - Religion vs CMs frequency of use 56
Table 13. Components of the KC composite 59
Table 14. Model i beta values 62
Table 15. Crosstab: Religion vs Education Level 64
Table 16. Model ii beta values 66

LIST OF FIGURES

Figure 1. Cross-country comparison of Birth Rate vs HDI. 8
Figure 2. Fertility patterns of World's selected regions. 10
Figure 3. Mortality and fertility rates in the long-run. 15
Figure 4. Socio-cultural regions of Guatemala 20
Figure 5. Contraceptive Prevalence in the Central American Countries. 21
Figure 6. Distribution of Respondents by Age 46
Figure 7. Scatter plot of opinion on spacing pregnancies vs CMs usage 50
Figure 8. KC composite variable distribution..... 60
Figure 9. Respondent's age vs Usage of CMs 63

LIST OF ACRONYMS

CMs	Contraceptive Methods
INE	National Institute of Statistics
UNDP	United Nations Development Programme
HDI	Human Development Index
TFR	Total Fertility Rate
APROFAM	Association for the Family Wellbeing

CHAPTER 1: INTRODUCTION

There is a strong support from both statistical and theoretical studies that the level of population growth of any country or community has a meaningful impact on its level of development. Neither a very high level nor a very low one are desirables for the general well-being of its citizens. Fertility rate is one among several fundamental factors that are able to shape the socio-economic status of a nation.

Over the last decades, The Republic of Guatemala has exhibited either the highest or one of the highest population growth rates in Latin America, a considerable high growth rate even for World standards, falling just behind most countries in the Sub-Saharan Africa continent and several Middle East nations.

Efforts from both the government and civil society, with reasonable levels of success, have been exerted over the last decades in order to improve this social problem. Nevertheless, there is still way to go and there are still, as in any other part of the globe, questions without definite answers whose understanding is crucial for the proper implementation of future population policies.

With the aim of contributing to a better understanding of the reasons driving the population growth rate in Guatemala this work addresses the role of the catholic faith and its influence in the family planning of the working lower class of its society. This factor, which despite having been considered in several studies, has not been the main subject to consider but has been merely utilized as an additional element to elaborate social constructs.

The conclusions to be derived from this work are not intended to explain the whole fertility rate phenomenon but to become a useful pragmatic tool whose results help to enrich the understanding of such a complex social issue.

The analysis and therefore the focus of this work is on the lower working class of Guatemala City. Nevertheless, the nature and characteristics of the work are expected to enable its insights and conclusions to be applicable to similar urban areas within the Guatemalan territory.

1.1 Research Background

Several studies about birth rate and contraceptive methods in Guatemala have been conducted but they all have in a way or another dismissed the relevance of the Catholic faith in the individual level. Among them, (Grace, 2008) explains the whole situation of the country by mentioning factors such as the civil-war that the country lived in between 1960 and 1996 and the political instability that affected the country during the last decades of the XX century. As another example, The Council on Hemispheric Affairs on its website (Ospina, 2015) explains the worrying high birth rate among teenagers by citing as causes problems in education and health, poverty, legacy of sexual violence besides the lack of government response by enacting and enforcing policies that effectively could tackle the problem.

This kind of studies acknowledge the presence and significant intervention of the Catholic Church not only in liturgical but also in economic and political activities, however, during their analyses they include this institution just as another demographic element useful for depicting a social background without properly questioning at what extent the teachings of the Catholic Church impact on the

decisions, concerning sexual life and family planning, that millions of believers take in their daily life.

1.2 Objective of the Study

Analyzing the impact of the Catholic faith on the usage of contraceptive methods and therefore on the birth rate of Guatemalan society in the individual level by distinguishing those who have adopted the Catholic faith and those who don't, so that conclusions can be derived in the light of different sets of beliefs of the people, contrary to the typical argumentation process where social contraceptive methods usage patterns are analyzed, and only after that the Catholic faith is taken into account just as a way to illustrate its influence on the society as a whole.

The target group of the present work are students, educators and people related to academia who desire to enrich their knowledge on fertility rates and contraceptive methods by considering the case of the low income urban sector of Guatemala City. It is assumed therefore that readers of the present work have at least a fundamental knowledge on social matters and a basic but clear understanding of statistical tools used for analysis of both numerical and categorical data.

1.3 Research Question

Are the teachings of the Catholic Church against contraception a major factor hampering the reduction of fertility rate in the lower working class of Guatemalan society?

Additional Questions

Do the teachings of the Catholic Church against contraception hinder the use of contraceptive methods as much as financial constraints in the lower working class of Guatemalan society does?

How well can the teachings of the Catholic Church against contraception, as a social factor, explain a reduction in the use of contraceptive methods in comparison with other social factors?

When explaining the degree of usage of contraceptive methods is the Catholic faith statistically more significant than the education that women have about these methods?

1.4 Significance

Dealing with human behavioral patterns is not a simple task. Plenty of different scenarios and countless variations from individual to individual make social research highly vulnerable to statistical threats and misleading conclusions. The situation worsens if it is considered that among human institutions, including those dealing with research and teaching, there might be predefined goals and criteria, or certain tendency to advocate for specific interests. This all could lead to either a bias during the research process or to simply overlook social important factors that the person(s) in charge of the research, or the society itself, might be comfortable with. Guatemala, historically speaking, has been mostly a Catholic country during the last centuries. This is an important social factor that, besides being worth to be studied, could pose

a threat to the objectivity employed by research institutions during their investigative and analytical process. The present work, on the other hand, adopts an empirical and objective approach by considering the religious faith of the interviewees in the individual level, making it possible to look for statistical patterns and conclusions for different sub-samples in terms of religion.

Over 50 variables have been used in this research. It analyses empirical data on birth rate, family planning and contraceptive methods but, contrary the research design of other studies, it highlights and analyzes the importance of Catholic faith in the individual level of the respondents of the sample, not in the social construct.

The academic world has largely studied different exogenous variables which can explain satisfactorily well the behavior of people towards their level of employment of contraceptive methods and the influence of this behavior on the birth rate of a region or country. The present work develops this kind of analysis on the lower economic class of Guatemalan society, which is the socio-economic sector most affected by significant high birth rates, while including in the analysis commonly overlooked factors in order to test the level of impact of the Catholic faith on people's behavior.

The results and the corresponding conclusions are thought to be able to enhance the knowledge of future studies which could aim for explaining the still ongoing high fertility rate in Guatemala by considering not only the "traditional" explanatory variables but also other factors whose explanatory potential has not been considered yet. Moreover, the conclusion and recommendations of the present work are thought to be a supplementary additional point of view that could be taken into account by not only future academic works but also local decision makers dealing with tasks of reduction of levels of birth rate in Guatemala City and the like.

1.5 Thesis Structure

- Chapter Two, the literary review. It covers the basics on the general importance of adequate TFRs for a country, and therefore, the relevance of the usage of contraceptive methods. It narrows down the focus on the case of Guatemala as a nation, its background and current situation.

- Chapter Three. The general justification of the questionnaire that was administered as the tool for data collection as well as the rationale behind the data analysis are described in this chapter. A supplementary part by part description of it is included in the Appendix C.

- Chapter Four. It presents the statistical summaries and analyses on the collected data. The analysis flows in sequence through each of the subchapters, where calculations done with the SPSS software are included. Each part of the chapter includes findings themselves and their corresponding analysis.

- Chapter Five, is the continuation of the analysis of the findings but against theories presented in the Chapter Two and other third considerations. It also reviews the statistical model which according to the gathered data best explains the contraceptive prevalence in the low-income sector of Guatemala City.

CHAPTER 2: LITERATURE REVIEW

2.1 Development and Fertility Rate

The demographic-economic paradox is a phenomenon over which the vast majority of both scholars and politicians agree. Statistics clearly show how the higher the degree of education and income of a certain population is the fewer children are born there. In fact, it is not a pattern that could be considered exclusive to certain geographical area nor to certain communities that exhibit some specific religious or racial characteristics but a global socio economic behavior, as it is shown in the Figure 1, a self-elaborated graph using data provided by (UNDP, 2015)

There are certainly plenty of ways to measure the degree of development of any particular community or nation. The subjective nature of the concept 'development' and the wide variety of points of view held by different scholars are just two among many reasons that could make it an endless endeavor. Human Development Index (HDI) is one of the most widely accepted composite index used to estimate different development levels. The United Nations Development Programme (UNDP) in its Human Development Reports (Jahan, 2015) explains how the HDI aims to capture three essential human choices regarded as fundamental dimensions of human development. A long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living.

In order to exhibit the clear relationship between development and fertility rate, the following chart has been constructed upon the HDI values of over 180 nations and its corresponding overall birth rate level (no. of births per 100,000 inhabitants).

“Development is the best contraceptive” (WHO, 2008) is a statement made by Dr. Singh at the World Population Conference in 1974 and professed by organizations such as the World Health Organization that clearly illustrates this whole situation.

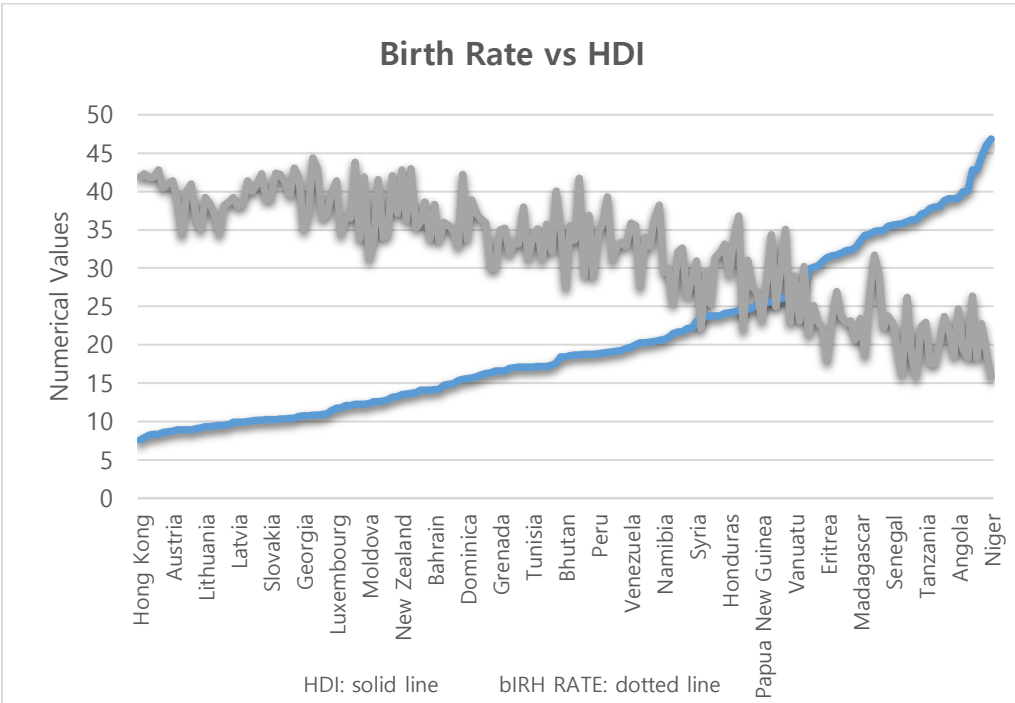

Figure 1. Cross-country comparison of Birth Rate vs HDI. *(Data: UNDP)*

2.2 Total Fertility Rate Facts

The total fertility rate (TFR) of a population is the average number of children that would be born to a woman over her lifetime, under the assumption that she were to survive from birth through the end of her reproductive life (commonly regarded as until the 49 year old age).

According to the World Bank's database, the estimated world average TFR is 2.45. It means that the average woman in this world would give birth to about two children and a half over her lifetime. And this number, in fact, is rather close to the TFR replacement level which is the total fertility rate at which women give birth to enough babies to sustain population levels. Even though replacement levels vary between countries, 2.1 births per woman could be roughly considered as the average TFR replacement level. (Casterline, 2010)

Given the important relationship between birth rates and development, governments and international agencies have promoted numerous researches and campaigns in favor of fertility rates favorable to the socio-economic interests of the country. Despite on all the progress that nations have achieved (mostly the developed ones) birth rate and indeed population growth continue being a big issue concerning everybody. The fact, among many others, briefly stated by World Overpopulation Awareness: "three babies are born every second" help to illustrate the dimensions of this issue.

Developed countries usually have a much lower fertility rate due to greater wealth and a number of other important factors that are further discussed. Developing countries, on the other hand, usually exhibit higher levels, which more often than not represent a hinder for the proper socio economic development of the nation. This is particularly true in the African continent nations although it is worth to mention that there are also some other countries, as is the case of Guatemala, whose levels are still considered above of the socio economic optimal one.

Too low TFR levels or levels substantially under the desirable level are considered as a potential threat to the domestic economy of a country since, should the pattern last over a long period of time, the population of the country would age and the necessities of the relatively big third age population of the society would overwhelm the insufficient working class of it. Such is the case of several European Union countries, Japan and South Korea whose TFR levels as for 2013 are, according to the World Bank, 1.6, 1.4 and 1.2 respectively. According to records of 2013, the same year on the other end of the spectrum, the group of the developing Sub-Saharan African countries average a fertility rate of 5 children per woman. Somewhere between the African and European levels it is possible to find the cases of Bolivia and Guatemala, whose TFR levels although quite below African standards are still above most of the other Latin American countries. The latter of these reporting a fertility level of 3.3 children per woman.

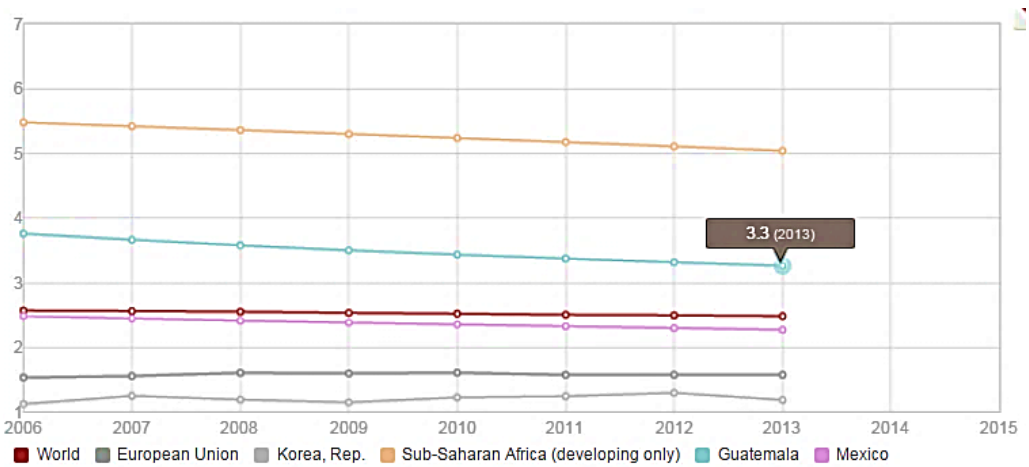

Figure 2. Fertility patterns of World's selected regions. *(Source: World Bank)*

2.3 Fertility Rate Theories

Fertility regulation behavior is posited as a direct function of two constructs, namely motivation to regulate and cost of regulation. Motivation to regulate, in turn, is determined by the demand for children (e.g. desired number of children) in relation to the current supply of children; when the current supply matches or exceeds the demand for children, there is motivation to take actions to avoid becoming pregnant. Notice that motivation is driven primarily by the demand for children but is also affected by biological factors, themselves conditioned by social and cultural factors, and that these biological factors affect the pace of childbearing (i.e. supply of children) once a woman becomes physically capable of conceiving. (Casterline, 2010)

From a theoretical standpoint, which is essential to have a better understanding of any numerical analysis, numerous authors have tried to explain why individuals decide or aim determined number of children. Among them, (MacDonald, 2002) offers four relevant non-mutually exclusive theories.

The first one, *Rational Choice Theory,* states that, "in deciding to have a child, people make the considered calculation that the benefits of an additional child outweigh the costs. While much of the cost may be figured in dollar terms, there are no dollar benefits. Instead, the benefits consist of dimensions of a psychological nature that are not readily quantifiable."

This theory explains that people have some calculus of the psychological gain of having the next child. This will be highly variable across individuals. If the economic costs of children rise, some individual psychological thresholds will be crossed and

decisions will be made not to have the next child. This theory, however, relies on the important assumption that individuals are educated well enough at the extent that they will take the proper decisions.

Risk Aversion Theory, the second theory, goes one step further by stating that people base their choices on the perception of their future. In other words, uncertainty and expectations play a key role here. "Risk aversion theory implies investment in economic security (education, attachment to the labor force, long hours of work, savings) rather than in the insecurity that accompanies having children (low income for a period, uncertainty of return to the labor force, higher consumption expenditure, and economic responsibility for dependents)."

A third theory, *Post-Materialist Values,* stresses that values of the sort of individual realization are responsible for social and demographical changes. Thus, it is the liberal degree of a society which determines the behavior it will have regarding fertility and other social issues. On the other hand, critics of this third theory, as (Coleman, 1998) explains, point out that 'post-materialism' may amount to little more than a position on a conservative/liberal dimension, and may only flourish due to the influence of other factors such as taxation or welfare systems.

The fourth theory, the *Gender Equity Theory* which essentially claims that the more balanced the levels of empowerment of both man and women within the family is the more likely the fertility rate will drop in a society whose fertility rate is high. In other words, if women are provided with opportunities nearly equivalent to those of men in education and market employment, but these opportunities are severely curtailed by having children, then, on average, women will restrict the number of children that they have, to an extent that leaves fertility at a very low level in the long term.

There is a useful real example explained by (Chesnais, 1996) that illustrates well the impact of gender equality (and another factor) on fertility rates. It compares the evolution in the levels of fertility in the still commonly labeled as traditional, Catholic, and family oriented Italy and the more liberal Sweden. The former, whose fertility rate used to be higher than the latter's rate half a century ago, experienced a so rapid decline in its fertility rate that it has become quite lower than the Swedish counterpart during the last decades, as shown in the following table.

Years	Italy	Sweden	Difference	EU
1960 - 64	2.46	2.3	0.16	2.69
1965 - 69	2.49	2.21	0.28	2.63
1970 - 74	2.35	1.89	0.46	2.25
1975 - 79	1.96	1.67	0.29	1.89
1985	1.42	1.73	-0.31	1.59
1990	1.3	2.13	-0.83	1.54
1995	1.17	1.74	-0.57	1.4

Table 1. Total Fertility Rates in EU countries, 1960-1995. Source: (Chesnais, 1996)

The explanation of these drastic changes in fertility levels could be given mostly by observing two core factors. First, the changing gender roles. There has been an extraordinary improvement in female educational attainment in Italy during recent decades. Girls now have higher average levels of schooling than boys. Young women's expectations and ambitions are very different from those that characterized earlier generations of Italian women. The second factor is the lack of social protection for children. In Italy, the share of child benefits within the total social security budget has diminished markedly during the period of fertility decline: it was 13.3 percent in 1970 and 3.9 percent in 1992.

Gender equality mattered in the decline of fertility rate in Italy during the previous decades but there was also another factor, no less important, the social protection. This second factor, indeed, paves the way to an important concept used to explain fertility rates in general, the pension system.

Pension Systems, is the factor claimed to be the major event responsible for driving a low fertility trend in modern society during the last decades (Fenge & Scheubel, 2010). In the same way that Italian fertility rates dropped due a decrease in the levels of governmental support, (Bjorklund, 2006) shows evidence suggesting that policies supporting families financially do raise fertility levels.

Pension Systems is a factor that deserves to be seriously considered. Although not a theory per se, its implications and results have been theoretically and statistically studied. The European Central Bank explains how fertility has long been declining in industrialized countries and how the existence of public pension systems is considered as one of the main underlying factors. (Fenge, 2014) provides sophisticated statistical evidence based on historical data on the mechanism by which a public pension system depresses fertility claiming that the effect amounts to a total reduction of approximately 1.7 marital births per 1000 between 1891–1899 for a pension increase between 20% and 100% of the internal rate of return.

From a more sociological point of view (Brewster, 2000) stresses the importance of the female labor force participation in a society and its close relationship with its fertility rates. Nevertheless, even when it was possible for her to find patterns and a satisfactory level of correlation between female participation in the job market and fertility rates these patterns have changed over the time which clearly suggests the influence of some other third explaining factors.

Mortality, could be argued, is another important factor. "Mortality decline and fertility decline are entwined in classical demographic transition theory, with mortality decline leading and motivating subsequent fertility decline. From a societal perspective, lower fertility seems an inevitable, though often delayed, response to lower mortality; otherwise population will grow relentlessly" (Casterline, 2010)

Mortality has been a key factor explaining long-run fertility trends. (Van de Kaa, 2002) calls the long-run phenomena the first and second transitions. In European societies, fertility decline began in the 19th century (first transition). It was a reaction to the disequilibrium that resulted from the long-term decline in mortality. The average family size has declined to such low levels that the social age structure is seriously affected and the replacement of generations is no longer assured. This has paved the way to what (Van de Kaa, 1999) calls the second transition. Following the inertia of the low fertility rates, they eventually are not even able to match the death rates resulting in a population deficit which is compensated by immigration. Immigrants coming from less developed countries whose mortality rates, one could guess, are relatively higher.

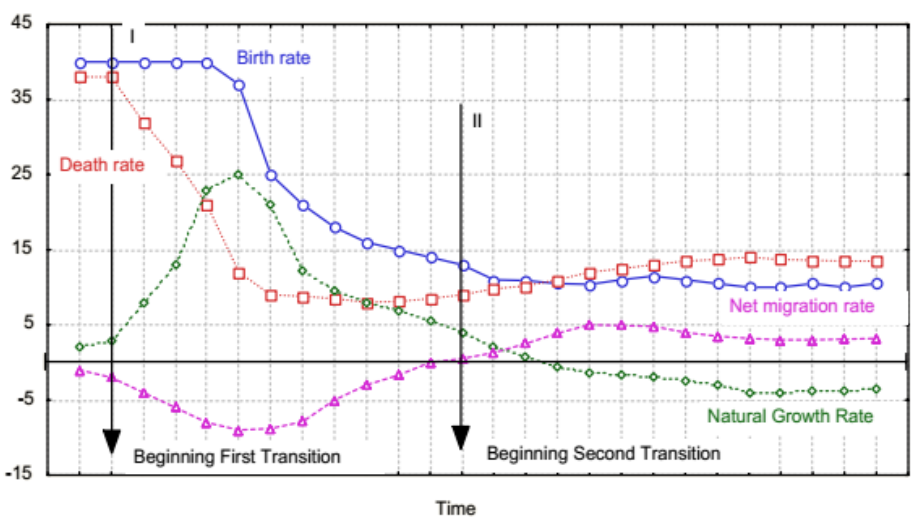

Figure 3. Mortality and fertility rates in the long-run. Source (Van de Kaa, 1999)

Certainly, both theories and factors about fertility rates are abundant but another factor that deserves being considered is *Urbanization*. As explained by (Casterline, 2010) fertility is almost always lower in urban as compared to rural areas. So is the demand for children (desired number of births) lower in urban areas. There is a significant net effect of urbanization on fertility decline that is smaller in magnitude than the effects of mortality decline and educational increase but larger in magnitude than the effect of income growth.

Age of the first union, is also considered by some, like (Casterline, 2010), as an important factor contributing to the decline of fertility rates, claiming that age at first union is relatively young in most high fertility societies (less than age 20 on average). Several years' delay would contribute to fertility decline, and it would have other health and socioeconomic benefits. (MacDonald, 2002) supports this posture by saying that "Psychological costs probably rise with age or, perhaps, increased age leads to downward rationalization of the perceived benefits. Accordingly, as the age at childbearing increases, people will be less likely to have additional children". It is arguable however that the *age of the first union* is a direct consequence of the level of education of a society and is, therefore. not a factor itself. Nevertheless, even if the *age of union* is not considered as an independent explanator of fertility rates it does can be utilized as an indicator of the level of sexual education and education in general in a society.

2.4 Contraceptive Prevalence

Regardless of any underlying theoretical explanation of the different aspects that can foster and hinder population growth; human beings, more specifically those being able to procreate, will ultimately need to take the decision of whether or not leaving open the possibility to have children when having sexual relations. It is, all of them will face the question whether to use any of the available contraception methods or not.

In fact, the condition of wanting to avoid or postpone childbearing but not using any method of contraception is known as "Unmet need for family planning". As explained by (Sinding, 2000), this has been a core concept in the international population field over decades. Under the label "KAP-gap", for knowledge, attitudes, and practice regarding family planning, the concept had its origins in the first fertility and family planning surveys carried out during the 1960s. The identification of the KAP-gap was an important milestone in the development of population policies and programs through the 1960s, particularly in Asia.

The level of usage of contraceptive methods is opposite to the unmet need for family planning, and although it is arguable that "contraception prevalence" is not "contraceptive access", scholars, such as (Pritchett, 1994), claim and show evidence that fertility is principally determined by the desire for children, and therefore, contraceptive access (or cost) or family planning effort more generally is not a dominant factor in determining fertility differences. Moreover, although the level of contraceptive access of a certain community might indeed affect its contraception prevalence, there is no better estimator to consider at the moment of measuring the degree of actions taken by families or unions of a certain community in order to plan

their offspring.

According to United Nations (Population Division, 2015), in its strictest sense, contraceptive prevalence is the percentage of women who are currently using, or whose sexual partner is currently using, at least one method of contraception, regardless of what method it is.

It is usually reported for married or in-union women aged 15 to 49. Stated as a mathematical formula it would be:

$$CP = \frac{WRA\_CM \times 100}{WRA}$$

where,

√ CP is Contraceptive Prevalence

√ WRA_CM is the number women of reproductive age (15-49) who are married or in an union and who are currently using a method of contraception

√ WRA is the total number of women of reproductive age who are married or in an union

Under this criterion, as of 2013, in the world there are about 1,834 million of women in childbearing age (15 through 49) out of which an estimated 63% makes use of any method of family planning, it is, either she or her partner makes use of at least one (temporary or permanent) contraceptive method. (PRB, 2013)

Sadly, when breaking down this indicator among countries of different development levels the numbers don't favor the least developed ones, as shown in the following figure.

Countries	Women Ages 15-49*	Any Method (%)
More developed	291	72
Less developed	1,542	62
Less developed (excl. China)	1,162	54
Least developed	222	34

Table 2. Contraception Prevalence by group of countries. Source: UN Population Div.

On the positive side, in developing countries, there is a clear trend towards increased Government support for methods of contraception and this trend is especially visible in the group of least developed countries. (UN Population Division, 2003)

As for the Continental American countries, only Guatemala, Guyana and Suriname fall in the third out of five categories measuring contraceptive prevalence at national levels. According to the study, published by the WHO Public Health Information in 2012, these are the only three countries with contraceptive levels below 50 percent.

2.5 The Case of Guatemala

Located in the Central American isthmus, along with other five countries, Guatemala comprises an area of 108,889 square kilometers. Although differences in land among the Central American countries are not large, with an estimated population of 16 million habitants, Guatemala clearly contrasts against the average estimated population of 6 million habitants of the other five countries.

In the national level, Guatemala shows important differences in terms of culture, race, development, and language. Spanish is the only official language of the country but there is a significant portion of the population whose mother tongue is any of the 23 national indigenous languages. Based on projections of the most recent census of the country (INE, 2003), between 25 and 30 percent of the population's mother tongue is not Spanish. Although dispersed, the highest concentrations of Mayan languages speakers in the country are found in the western highlands (regions 6 and 7) and the northern jungle (region 8), as shown in the following national map.

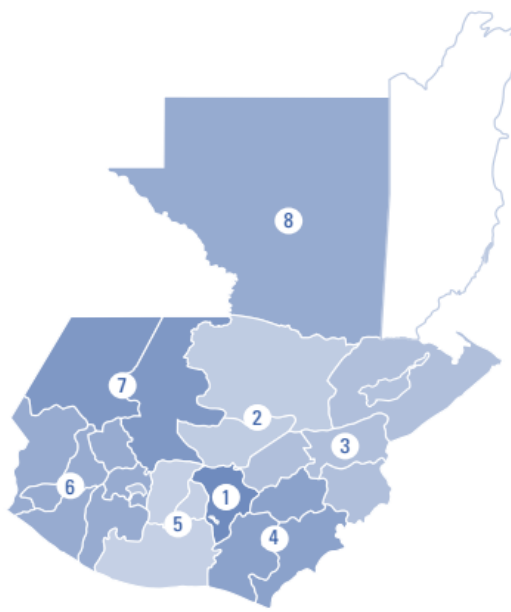

Figure 4. Socio-cultural regions of Guatemala

The southern eastern regions of the country (3 through 5 in the previous map) are the least densely populated regions, inhabited mostly by mestizo and white people whose mother language is Spanish. The central region (number 1 in the map), as the capital and the economic engine of the country, is a convergence of ethnicities but with a clear predominance of the Spanish language. (INE, 2003) The capital city, the most developed region, is certainly also the most densely populated region although

a major factor for this is the immigration from the countryside, mainly from the western highlands, whose fertility rate is the highest in the country.

Contraceptive Prevalence in Guatemala

According to reports developed by the United States Agency for International Development (USAID) the percentage of women in union making use of contraceptive methods at a national level was around 43% in 2002 and around 54% as of 2010. (Grace, 2008)

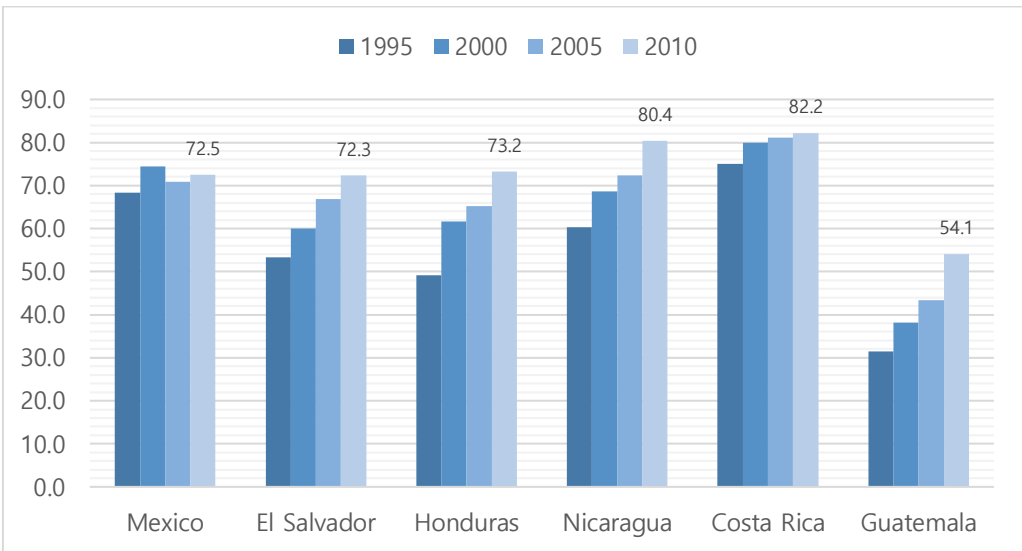

Figure 5. Contraceptive Prevalence in the Central American Countries. (Data: USAID)

There is certainly an increasing trend. Still, it clearly contrasts with the prevalence numbers present in neighboring countries despite most of them have relatively similar economic levels.

An essential national characteristic that must be consider is the multi-ethnicity of the country. Despite an overwhelming population capable to speak Spanish, there is a

number of different races among the population. They vary from white to Mayan descendants, going through several levels of mixed races such as ladino, mestizo, *zambo* (a mix of black and Mayan), and black.

A sizeable portion of the Guatemalan population, 40 percent, belongs to one of the 23 Mayan indigenous ethnic groups of the country. This diversity of cultures and Mayan languages, as illustrated by (Siow, 2009), is a key factor explaining the differences in contraceptive prevalence between Guatemala and the rest of countries in Central America. A given example, in the neighboring country, El Salvador, from 1993 to 2003 the contraceptive use among the poorest quintile of the population increased from 33 percent to 52 percent, while in Guatemala in approximately the same period of time the contraceptive use in the poorest quintile of the population went from 4 percent to just 18 percent, which is comprised mostly by Mayan population. Contraceptive use has been especially low among Mayan women and the 40 percent of Mayan population in Guatemala clearly contrasts against the 7, 0.8, 5 and 2.4 percent of Honduras, El Salvador, Nicaragua, and Costa Rica respectively.

The vast majority of Mayan descendants in Guatemala live in mountainous rural areas. For centuries, they have worked the land using subsistence farming techniques that have resulted in degradation of the soil. As a result, nearly a million Mayans are forced to migrate annually to the southern coastal areas of the country on a seasonal basis (3-4 months a year) to harvest other crops. This has proven very disruptive to the education of the children involved in this process and has perpetuated their low educational status. (Carolina P Center, 2000)

From time to time, especially during the last decades, low educated young people decide to migrate to Guatemala City in pursue of better employment opportunities. Despite this capital city is considerably more active in economic terms, the lack of

education of the immigrants prevent them from getting a proper job opportunity that could improve their socio-economic status. Demographically speaking, many of the immigrant families keep living and growing in number in Guatemala City, usually at higher rates than those owning better economic means.

Sexual Violence

Another important factor explaining high fertility rates and a lower level of use of contraceptive methods is the sexual violence that a non-negligible number of women suffer in the national territory. The Ministry of Public Health (Guzman, 2014) states that between January and August in 2,012 38,645 pregnancies of teenagers were recorded. Among them 1,865 were younger than 14 years old. 60% of the pregnant teenagers are indigenous people, 70% live in poverty conditions and 80% dropped-out school.

According to official data every year there have been around 4,000 marriages of female teenagers whose age is between 15 and 19. Moreover, there are around 73,000 thousand pregnancies among teenagers whose age is between 10 and 19. (Gramajo, 2015)

2.6 Major Policies and Events

It is also important to take into account main events that have taken place in the international sphere. In one way or another, bilateral or multilateral agreements or some other pressure means have contributed to shape policies at the national level.

One could consider five phases in the evolution of government population policies according to (UN Population Division, 2003): (a) the 25-year period following the establishment of the United Nations (1945-1970); (b) the decade of the 1974 World Population Conference in Bucharest (1970-1980); (c) the decade of the 1984 International Conference on Population in Mexico City (1980-1990); (d) the decade of the 1994 International Conference on Population and Development (ICPD) in Cairo (1990-2000); and (e) the beginning of the 21st century.

In the aftermath of the II World War neither richer nor developing countries had population concerns among their top agendas. Demographic data were generally lacking or deficient in many countries, including the case of Guatemala. However, by the end of the 1960s, concern was growing in the United States and Europe about population increases in developing countries and the strains placed on resources. For example, a bill was introduced in the United States Congress in 1967 to appropriate funds to support voluntary family planning programs in "friendly" foreign nations. (UN Population Division, 2003)

In 1967, USAID signs first tripartite agreement (no. 520-0189) for "Population and Rural Health" with the Guatemalan Ministry of Public Health (MPH) and the Association for the Family Wellbeing (APROFAM) by its initials in Spanish. As a consequence of it, APROFAM is authorized to initiate Family Planning services in 23 health centers. (Carolina P Center, 2000)

Currently APROFAM is one of the five main pillars regarding family planning in Guatemala. Third in importance behind the MPH branches and normal drugstores, it is more frequently visited to get a contraceptive solution by the average citizen at the national level than any other private sector option or the Institute of Social Security (IGSS) itself. (Cisek, 2016)

Nowadays it has 11 healthcare centers in the central region, 5 in the south, 5 in the western region and 5 in the north-eastern part of the country.

Interestingly, despite the different family planning efforts carried out by both private and public sector entities, the corresponding policies have never considered the Catholic faith as a major factor. This, despite the Catholic Church is an institution with a presence of over 500 years in the region whose doctrines have influenced continuously numerous generations over the last five centuries.

Studies have not addressed the real impact of such important institution. Despite the inclusion of variables of the sort of 'religion' and 'beliefs', studies have not regarded believers of the catholic faith and not believers as different population with potentially different patterns of contraception methods.

Asking about somebody's faith has been utilized merely as a way to build a social construct of the population who is being surveyed rather than a major factor able to explain a respondent's behavior regarding contraceptive usage patterns. It has been used more to enrich a group description rather than as a basis to understand human behavior.

It is important to make the distinction between catholic adherents and people who identify themselves as such but who in reality do not follow the basic doctrines and sometimes don't even know what these are.

CHAPTER 3: RESEARCH METHODOLOGY

An exploratory research was planned to be conducted to estimate, if exists, the degree of influence of catholic beliefs in the non-employment of contraception methods among urban lower working class families of Guatemala City.

The approach was designed to be not entirely quantitative nor qualitative due to the nature of the research and the necessary information to be gathered through questionnaires. This information to be statistically transformed and subjected to regression analyses. A significant part of the questions is aimed at identifying factors, other than the catholic influence, which can significantly affect the results. In other words, the purpose of the information of this group of questions is, rather than being used in statistical calculations, to support a subsequent qualitative analysis of the statistical results in the light of fertility rate and family planning mainstream theories.

Considering that the core of the problem, the highest fertility rate, occurs mostly in the lower economic class of the society, and considering that The Ministry of Health of Guatemala, in cooperation with the Ministry of Labor, provides public free medical assistance to a considerable part of the population but only to those (together with their corresponding families) whose workplace is formally registered at the Ministry of Labor, a portion of the questionnaires were administered at the two national public hospitals of Guatemala City, where virtually the entirety of patients belong to the lowest economic class since most of the medical services are free or at least far less expensive than any other medical center of the capital city. The rest of questionnaires were administered at one of the Guatemala City branches of the National Social Security Institute (IGSS), where workers, and workers' families, who cannot afford medical attention at private hospitals, can get free medical care.

Considering the purpose of this work is analyzing the individual behavior at the societal level, questionnaires were chosen as the instrument to collect the information since they provide the best way to get measurable data as well as minimizing the imprecision and ambiguity in the answers that unstructured interviews are subjected to.

Questionnaires used in the present work (whose layout can be found in the Appendix B) are virtually comprised by only brief closed-ended questions aiming for a better standardization of the collected data, it is, a smoother transformation of the information from the answers given by the respondents to measurable values that are later used in the analytical stage of this work.

3.1 Research Design

It is no little the amount of literature available on Family Planning and Contraceptive Methods. Chapter Two of the present work covers the basics of both issues from a global perspective as well as important general information on the current contraceptive prevalence in the lower working class of Guatemala City. There are several official and non-official studies and statistical reports that provide abundant descriptive information such as The National Reproductive Health Survey (MSPAS, 2011), which is indeed the main source of the secondary data used in this work. This kind of authoritative official publications portray well the numbers regarding contraceptive prevalence but do not try to explain its underlying reasons.

Studies such as (Sable, 1997) and (Palamuleni, 2014) agree on a set of main categories or underlying factors affecting the level of contraceptive prevalence the society. These studies aim to generalize the most important factors and therefore the

level of incidence of each of these factors can largely vary from one society to another. The summary of these factors is portrayed in the following table.

Study object	Underlying factors
Contraceptive prevalence	Access
	Method of employment
	Knowledge
	Cost
	Health concerns
	Social norms

Table 3. Contraceptive prevalence underlying factors

The hypothetical construct, therefore, would be the aggregate of the contribution of the underlying factors, representing a linear function expression such as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_i X_i + e$$

where β i means the degree of influence of the underlying factor Xi on the level of contraceptive prevalence. It is important however, to notice that some of these factors cannot be directly operationalized as one single variable since the concept they indicate represent could encompass two or more variables. The concepts expressed by these factors are explained as follows.

- *Access* is about the availability of contraceptive methods for the society. This is a factor well covered on several studies. In this work this factor is not relevant given the fact that access is not a limiting factor in Guatemala City. Contraceptive devices such as pills and condoms are readily available throughout drugstores and supermarkets and, in certain areas of the city, even at some public healthcare centers.

- *Method of employment* is about the complexity in the usage of a certain method which results in the person or couple in its disregarding. Given the focus of the present work, which is on the intention of use rather than the proper use of contraceptive methods, this factor is irrelevant.

- *Knowledge* is about family planning and the knowledge on the existence, use and benefits of contraceptive methods. Since this work is limited to Guatemala City, this factor is assumed to be either irrelevant or meaningfully less important than the others. According to (MSPAS, 2011) over 99% of women in childbearing years living in urban areas know at least one of the modern contraceptive methods. (Still, this aspect was taken into consideration when designing the questionnaire for comparison purposes).

- *Cost* is about the financial burden the employment of contraceptive methods could mean to a given couple. In this work, it is considered as a potential limiting factor since the price of the contraceptive devices could be not affordable for lower economic classes. This factor is also considered as a parameter of comparison against other factors.

- *Health concerns*, is about misconceptions regarding contraceptive devices. People not using them on the belief that they could either affect their reproductive functions in the long run or bring about any kind of illnesses.

- Social norms is about what is socially accepted or not. This factor is the object of study of the present work. While social norms can comprise a wide variety of sub-factors, the social setting of Guatemala, its overwhelming Catholic history, and its current society, where over 48% of individuals identifies himself/herself as Roman Catholic, suggest that the Catholic Church, which even today has a clear posture

against contraceptive methods, could still be exerting a meaningful influence hindering the contraception prevalence in Guatemala City (and the country itself).

Variables

All the factors just mentioned in the previous section are constructs to be transformed into the following corresponding variables. As already mentioned, both *Access* and *Method of Employment,* although, based on mainstream theories, important factors explaining the contraceptive prevalence in other countries or regions, are not to be considered in the present work given the urban setting of Guatemala City.

Underlying factor	Variable	Symbol	Type of value
Access	Irrelevant		
Employment method	Not applicable		
Knowledge	sexual education	SE	categorical (dummy)
Cost	Freely provided	FP	categorical
Health concerns	Worry	W	categorical
Social norms	Catholic faith	CF	categorical
	Family influence	FI	categorical

Table 4. Explanatory Variables

The dependent variable, in turn, is to be represented by the level of *Contraception Usage* (CU), a ratio-type variable. Thus, the model to be subject to a regression analysis would be something like:

$$CU = \beta_0 + \beta_1 SE + \beta_2 FP + \beta_3 W + \beta_4 CF + \beta_5 FI + e$$

Model 1 (including Catholic faith influence)

The elaboration and analysis of this model, besides helping to determine how well these factors combined explain the level of contraception usage, becomes a comparative tool to be used along with the following method where the influence of Catholic faith factor is removed from the model.

$$CU = \beta 0 + \beta 1\ SE + \beta 2\ FP + \beta 3\ W + \beta 4\ FI + e$$

Model 2 (excluding Catholic faith influence)

Given the complexity of social models, where this one is not the exception, some control variables are also considered aiming for a more homogenous sample and thus, better quality of the gathered data and conclusions. Spoken languages is the first of them. As explained in the chapter 2, Guatemala is a multicultural and multiethnic country where economic, social, and cultural differences between Spanish-only speakers and bilingual speakers (Spanish and a Mayan language) are evident. Therefore, in order to rule out confounding variables, of the sort of differences in the education and race, it was necessary to consider only either Spanish-only speakers or bilingual speakers. Between these two groups of potential respondents the former is intrinsically more uniform than the latter and more abundant in Guatemala City. Thus, questionnaires answered by bilingual speakers are not to be considered in the statistical sample.

The second control variable is *Education Level*. People without any schooling are not to be considered in the statistical sample. Besides the homogeneity motivation, despite that around 13% of the national population is illiterate, the proportion is much lower in the urban areas of the capital city. Considering illiterate women implicates the risk of adding a potential outlier to the sample. The third control variable, which is basically a natural result of the location of the study is Access to City Hospitals. Given the notorious differences between the western highlands of the

country, the urbanized center, the northern jungle and the coastal south, considering only women with access to healthcare in the capital city contributes to a better uniformity in the profile of the respondents.

3.2 Population and Sampling

The statistical population of the present research is comprised by all the Guatemalan women in reproductive age who do not speak any national language other than Spanish and who also meet the following criteria:

1. Belonging to the lower economic class.
2. Living or having access to healthcare services provided in Guatemala City.
3. Despite economic limitations, have any level of schooling which could be as low as partial elementary school and could be any higher. This, in turn, guarantees the literacy of the respondents considered in the sample.

4. Additionally, as a way to narrow down the population to get more accurate and useful statistical results, being pregnant is a condition. (The reason for this delimiting factor is explained in the next section, *Characteristics of the Respondents*).

Based on the previous conditions, the statistical sample was then determined to be a set of all the pregnant women who willingly responded to the questionnaires that were either administered or self-administered in any of three main public hospitals located in Guatemala City run by the either the Public Health Ministry of the Social Security Institute.

Characteristics of the Respondents

Guatemala is a conservative country where, despite high crime rates and other economic problems, sexual relations are socially well understood as a fundamental and exclusive part of marriage. Therefore, the action of selecting randomly women and asking them, among other questions, about their views and usage of contraceptive methods would constitute a serious threat to the quality of the collected data since many of those women could be single ladies who could automatically deny real postures and actions that could affect their social reputation. One solution to this problem could have been asking the civil status of the respondent beforehand and deciding if continuing with the questionnaire in the exclusive case she was married.

This, however, would have brought about a couple of drawbacks: 1. it would have represented more time consumption, 2. it could have given way to an unnecessary bias since the interviewer could have tended to look for only those women that according to his judgment are married, which in turn would be a threat to the principle of random selection, 3. it would automatically rule out the opinion of a significant portion of the population (any woman not either married nor living in a free union).

Focusing on pregnant women, on the other hand, allowed the interviewer to effectively tackle all of these problems. The obvious fact of being pregnant relieved the respondent from any social obligation to twist the questionnaire answers in favor of her social reputation. Being pregnant is an infallible proof of the active sexual activity of the respondent. By considering pregnant women, the interviewer did not need to care about social susceptibilities nor had to look for women who seemed to

be in a specific age range, which in turn, allowed the sampling process to be carried out under a real random basis.

Sampling Unit

Questionnaires were administered to a total of 203 pregnant women attending outpatient clinics at either one of the two national hospitals of Guatemala City, which provide healthcare services to any Guatemalan resident out of cost, or at the Maternity Unit of the Institute of Social Security Hospital, which, contrary to the two national hospitals, does not provide healthcare service to the general population but only to workers and workers' families whose employer is duly registered at the Labor Ministry.

1. San Juan de Dios Hospital, located in the downtown of Guatemala City (zone 1), founded in 1,667, it is the largest public hospital of the country.

2. Roosevelt Hospital, located also near to the central part of the capital city, inaugurated in 1,955, is the second largest public hospital of the country.

3. The Guatemalan Institute of Social Security (IGSS), which has two important functions. Being the public institution that administrates the pensions of retired workers, and providing healthcare to current and retired workers and their families. It has over 20 branches in Guatemala City alone. Some of these branches are specific about the healthcare services they provide. Among them, the Maternity Unit, which is located in the zone 9 of the capital city.

3.3 Data Collection

All of the empirical data was gathered through administration of questionnaires. All of them were virtually identical in design and all of them contained the same questions. Among the 203 questionnaires whose data is used in the present work, roughly fifty percent were administered by the same person who was previously informed about the nature, scope and purpose of the research in order to avoid instrument validity problems, and the remaining fifty percent were self-administered by pregnant women attending the IGSS hospital as outpatients where they were informed and advised by the doctors of the institution to properly answer the questions.

All of the questions excepting one were thought to be close-ended questions with the purpose of minimizing ambiguity in the information and processing time during the analysis. Nevertheless, the questionnaire covered both quantitative and qualitative questions in order to get the corresponding numerical answers from the former and key elements used during the validation of the data from the latter. It is, a subset of the questions is intended not for collecting data but for validating it and developing a complementary qualitative analysis of the statistical results. The questionnaire itself, Spanish and English translated versions, with all its questions is included in the Appendix A.

Sections and Items of the Questionnaire

All of the questions included in the questionnaire correspond to one of four categories, according to their purpose, as presented below. Their order in the questionnaire itself was deliberately different in order to contrast and double check the answers given by the respondents.

Each question is treated as a different variable to be statistically analyzed. It is important to notice that during the analysis of data it is not one but several variables which are considered as dependent. In the aim for more reliable data, there is a certain level of redundancy among the variables in order to clarify the actual answers given the respondents. This and other properties of the variables (questions) are explained as follows:

1. Questions on the profile of the respondent

This first group of variables are to shape up the profile of the respondent. Some of these variables are used as control variables demarcating the sample that is studied and some of them are used to filter (or control) results when analyzing how well catholic faith and other factors can explain the dependent variables.

2. Questions on religion

This is the key group of questions to be used in the analysis of data not only to differentiate between Catholic believers and others but also to double check the devotion of the respondents towards their Catholic faith. As it is usual in analyses of human behavior, the task of properly grasping a determined concept from human beings turns out to be a complex one where the employment of only a single variable could easily pose a threat on the validity of the data.

Therefore, as expected, the present research makes use of not just one but a set of variables representing overlapping ideas aiming at collecting more accurate information about the religious values of the respondents.

3. Questions on children and contraceptive methods

This group of questions is comprised by all of the endogenous variables considered during the analysis of data. Given the intrinsic complexity of human decisions and behavior during the analysis of data there are 3 aspects that are taken into account:

- Number of children that the respondent actually wishes to have. This is considered to determine any correlation that might exist between the respondent's goal, the number of children she wants to have, and her Catholic faith.
- Opinion on pregnancy spacing.
- Contraceptive methods, opinion, and actual usage.

The second and third aspects, although similar, differ in the opinion the Catholic Church has about them since this institution doesn't condemn the employment of the natural method of rhythm in order to space pregnancies whereas it does condemn the usage of modern contraceptive methods as a family planning tool.

4. Underlying Reasons

This group of variables correspond to the underlying factors that, according to mainstream theories, explain the contraceptive prevalence in the society. Among these six factors, summarized in the *Explanatory Variables Table*, two do not apply to the present work and the other four, namely knowledge on CMs, health concerns, social influence and financial limitations are included here.

To measure the knowledge on CMs a composite variable is used which is the sum of eight dichotomous variables representing whether the respondent knows eight different contraceptive methods.

Social influence, for the purposes of the present work, is divided into two sub-concepts: 1) the family influence and 2) the church doctrines' influence. To measure first sub-concept a composite variable is also used which is the aggregate of the respondent's partner opinion on CMs and the respondent's parents opinion on family planning. To measure the second sub-concept a normal dichotomous variable is used. Both health concerns and financial limitations are directly asked in the questionnaire.

In addition to the questions (variables) above mentioned, there is a group of five dichotomous redundant questions about reasons why not to employ CMs. Namely they are: difficulty to get the CMs, religion believes, health concern, shyness, and abortion concerns. This group of yes-or-no questions have been included for verification purposes solely in order to improve the quality of the gathered data.

The four group of questions and their corresponding items or variables are summarized in the following table. For each item, it is also presented the type of statistical data that is gathered, whether it is a closed-ended question in the questionnaire and the number of yes-or-no questions that comprise the item in the case it is a composite one. (The actual questionnaire and the individual explanation of each of its questions are found in Appendices B and C respectively.)

Items and Function	Type of data	Question type	Questions
Profile Info (exogenous)			
Age	Interval	Closed-ended	1
Spoken languages	Dichotomous	Closed-ended	1
Education level	Ordinal	Closed-ended	1
Province of birth	Dichotomous	Open-ended	1
Civil Status	Nominal	Closed-ended	1
Working status	Nominal	Closed-ended	1
Religion Info (exogenous)			
Religion	Nominal	Closed-ended	1
First communion	Dichotomous	Closed-ended	1
Catholic marriage	Dichotomous	Closed-ended	1
Frequency religious sermons	Ordinal	Closed-ended	1
Children and CMs (endogenous)			
Number of Children	Ratio	Closed-ended	3
Opinion spacing pregnancies	Ordinal	Closed-ended	1
CMs support/opposition	Ordinal	Closed-ended	1
CMs Usage	Ratio	Closed-ended	1
CMs before the pregnancy	Dichotomous	Closed-ended	2
Underlying Reasons (endogenous)			
CMs knowledge	Dich. composite	Closed-ended	8
Why in favor/against CMs	Dichotomous	Closed-ended	6
Social influence	Dich. composite	Closed-ended	2
Cost limitation	Dichotomous	Closed-ended	1
Church in family planning	Dichotomous	Closed-ended	1

Table 5. Items and their function, classified by group

3.4 Data Analysis

In order to properly analyze the data, both quantitative and qualitative analysis elements are considered. On the quantitative aspect, all of the information taken from the questionnaires was tabulated, filtered and analyzed in the SPSS software. Over 50 variables (including predictors, endogenous and dummies) were used with the aim at maximizing the accuracy and reliability of the information.

Prior to the input of all of the information a pilot test was conducted administrating the questionnaires to only 20 pregnant women. Then, after verifying the results, the remaining questionnaires were also administered. A total of 203 questionnaires were administered dismissing 2 of them given their set of answers lacking coherence and consistency.

On the qualitative side, the results obtained from the empirical data are compared against mainstream theories in order to verify the validity of the former, also, in order to analyze differences that could give way to academic contributions in the future.

3.5 Delimitation

Despite conclusions are expected to be applicable to different regions of Guatemala and also other cities with a similar social structure, numbers are strictly limited to Guatemala City, more specifically, to the lower economic class of the urban region.

The most affected areas in Guatemala by the phenomena studied here are the western highlands but for geographical limitations the present work has focused on a urban context rather than the remote areas in the countryside.

There is an evident gap between Guatemala City, mostly urban, and the western part of the country, mostly rural. Nevertheless, the present research aimed at the lower class of the urban population. This is not to be confused with the lowest class at the national level.

3.6 Validity and Reliability

As discussed in the previous section, only pregnant women have been considered in order to minimize a potential bias originated from social conceptions that may lead the respondent to answer something different from reality in favor of her reputation.

On the other side of the research, half of the questionnaires were administered by the same person (my father) who was previously introduced to and explained the logic and main goals of the present work.

Roughly, the other half of questionnaires were self-administered and that certainly gives way to a number of misunderstandings. However, all of those self-administered questionnaires were taken at the doctor's place under his personal advice and guidance.

Based on the validity threats that a research may be vulnerable to according to (Babbie, 2008) the present research performs as follows:

1. History. Not a threat since no time-series are considered.
2. Maturation. Again, it's not a research developed over a time
3. Testing. Not applicable again.
4. Instrumentation. All of the questionnaires were identical. Besides, the misunderstanding of certain question was tried to be minimized by using all but one close-ended questions.
5. Statistical regression: The 2 bizarre questionnaires found among 203 were dismissed before performing any statistical analysis.
6. Selection biases. The selection of the respondents was random.
7. Diffusion or imitation of treatments. Not applicable.

External invalidity doesn't pose any threat in this case either since there is no pretest and posttest process in this research.

Nevertheless, the intrinsic threat when attempting to explain human behavioral patterns and way of thinking is undeniable. In order to deal with that (at least at a certain extent) *composite variables* were used in the aim for reducing the level of uncertainty. It should be considered also that the present work is a study intended to enrich and complement previous studies on birth rate and family planning by contrasting their findings and conclusions and not to be a stand-alone research.

CHAPTER 4: RESULTS AND DATA ANALYSIS

All the information was collected via questionnaires delivered to over 200 pregnant women looking for medical services at any of three selected national hospitals located in Guatemala City. There was no preference nor priority given to any interviewed person. The data of all of the pregnant women who accepted to answer the questionnaires was taken as it was given. The corresponding transformation and corrections to the gathered information was later done exclusively during the analysis stage.

Roughly half of the questionnaires was administered person to person. The other half of the questionnaires was self-administered by voluntary women that visited one the outpatient clinics of the IGSS National Hospital. Each of the women that accepted to answer the questionnaire by themselves were explained the purpose of it by the doctor in charge. The information was collected as shown in the following table. The layout of the questionnaires that were administered (in Spanish), and their corresponding translation (to English), are included in the appendix B.

Hospital and Unit	Administration Method	Questionnaires Number
Roosevelt Hospital / Outpatient Clinic	person to person	20
Roosevelt Hospital / Maternity Unit	person to person	50
IGGS / Outpatient Clinic	person to person	30
IGGS / Maternity Unit	self-administered	103
Total		**203**

Table 6. Hospitals where questionnaires were administered

The information regarding the specific hospital where each questionnaire was administered, although not used to draw any conclusion, was recorded to compare the quality of the information among hospitals during the data analysis to minimize a potential internal validity threat.

4.1 Filtering the data

Among the 203 questionnaires, two of them were dismissed after considering the lack of consistency in the answers given by their respondents. Besides the fact that the questionnaire was completely structured, all of its questions but one were closed questions. The only open question, during the analysis of data, allowed to have an initial idea about the willingness of the respondent to actually answer the questionnaire.

Prior to analyzing data, some questions with null value were set to zero so that SPSS software did not consider them as missing values. Other than that, gathered results were not modified.

Although results were not modified, some questionnaires were not included in the analysis of data based on the sampling rules. As it is explained in the Chapter 3 in *Population and Sampling*, bilingual respondents were not taken into account. This group however, represented just the 5.5% of the total of questionnaires.

The vast majority of the respondents of the sample stated not being able to speak any Mayan language, which is not entirely surprising considering that questionnaires were administered in the capital city. Then, it is possible to say that there are two main social considerations regarding this issue:

1. Mayan languages are mostly spoken in the rural areas and not in the capital City where it is Spanish the language that every single person needs to command in the daily life. Questionnaires themselves were administered in Spanish and there was not a single report about any woman having problems understanding the questions nor giving her answers.

2. The social misconception about races and their entitlements within the country could have made people denying their faculty to speak a Mayan language in addition to Spanish. In fact, language is a highly-correlated variable with race in the national context and, as explained in the Chapter 3, with the purpose of avoiding social susceptibilities language was chosen over race as a demographic explicative variable.

4.2 Demographics of the Data

Key Variables

Given the fact that the sample was conducted on a random basis there was no criterion to rule out any respondent. The distribution depicted by the age variable is, as expected, a normal one, being 27 the approximate value of the sample mean, a value that corresponds fairly well with the population mean of Guatemala City.

Based on data provided by the National Institute of Statistics (INE, 2014) only around 17 percent of the population is in the 40 to 64-year-old bracket. This fact along with the consideration of the reproductive age which at national level is regarded as the ages between 15 and 59 signify that most of the respondents' age should be between 15 and 40, having 27.5 as their mathematical middle point. This

value is exactly the mean of the gathered data of the present work, as shown on the next graph. Both skewness and kurtosis levels of the sample are relatively low being their values 0.183 and -0.209 respectively. Interestingly the number of women interviewed in their 30s was slightly larger than those in their 20s and not the other way round, considering the young population in Guatemala. Nevertheless, the asymmetry is low enough representing not a threat to the validity of the statistical sample.

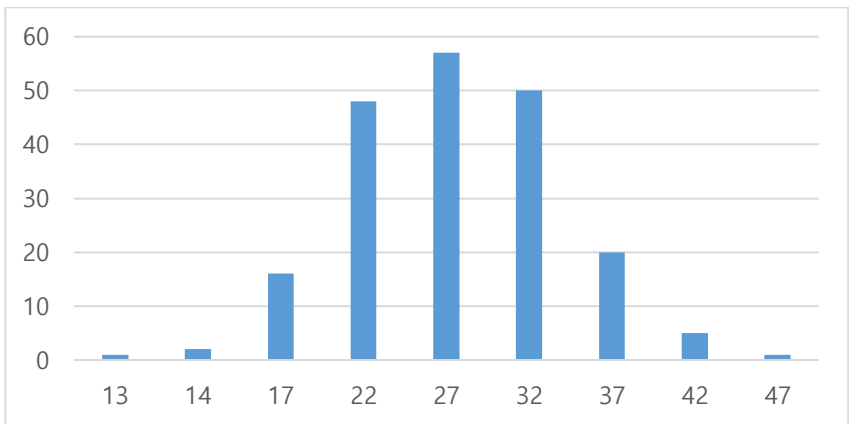

Figure 6. Distribution of Respondents by Age

As it was considered during the *Chapter 2*, education and financial statues are factors usually closely correlated with the birth rate of a certain region. As for education, it is one of the main differences between the urban population of Guatemala City and the average population living in the country side, mainly in the least developed regions of the western highlands. Because of this factor, among others, bilingual respondents (Spanish and Mayan languages) were not considered in the statistical sample. The National Institute of Statistics reports that the literacy can be as low as 69.1%, as is the case of Solola, one of the provinces in the western part of the country but it is over 91% in the Guatemala province (not to be confounded with Guatemala the country).

Now, the Guatemala province also exhibits inner literacy rate differences being the core urban region higher than the rest of areas within the province. Therefore, it is natural to expect that the percentage of respondents without any schooling in the statistical sample to be significantly lower than 9%.

Schooling level	People	Percent
Partial elementary	22	10.9
Elementary	32	15.9
Secondary	76	37.8
Other	59	29.4
Total	189	94.0
Didn't answer	9	4.5
No education	3	1.5

Table 7. Respondents' schooling level

As shown in the table above, the percentage of respondents with no education is way lower than the 9% reported by the (INE, 2014) for the whole Guatemala province. This, not only makes statistical sense considering the higher development in the core urban area of the capital city but also confirms the educational heterogeneity at the national level, an important reason to delimit the conclusions of the present work to the capital city setting.

As for the place of birth, despite that one of the inherent required characteristics of the respondents was having access to healthcare services in Guatemala City, it was never assumed that the place of birth of the respondents was the capital city itself. Each respondent was asked its province of birth and interestingly, regardless that all the questionnaires were administered in Guatemala City hospitals, almost half of the respondents answered to have been born in a province other than Guatemala central province, a faithful reflect of the high level of domestic immigration in the country.

Around 55% of the respondents were born in Guatemala province and over 41% in the countryside of the country, (a remaining 7% did not answered the question).

The migration phenomenon is a current important issue in the country and one of the drives of the present work. According to numbers provided by the (INE, 2014), over 35% of the Guatemala province residents were born in another province of the country. It is, over the third part of the population of the capital region is comprised by immigrants from the countryside. Although not large, there is a little difference between the official immigration statistics and the percentages obtained empirically.

On one hand, that little difference confirms the validity of the gathered information, on the other hand, the larger percentage reported in the questionnaires could be explained by the fact that the best healthcare facilities at the national level are located, as expected, in Guatemala City. Some pregnant women, despite their gestational condition might have needed to travel to the capital city due to unavailability of certain medical equipment in their places of residence.

As it is discussed later in the present chapter, working status, along with age, are the best explicative variables of the contraceptive usage in the present work. According to the National Institute of Statistics (ENEI, 2014) the female labor force participation in urban metropolitan region is slightly over 52%, roughly one out of two women works and one does not.

From the gathered data it is possible to calculate the female labor force as (31.3 + 9.5) almost 42% of the female population, given the numbers of full-time employees and part-timers, as shown in the following table.

	Frequency	Percent
Housewife	104	51.7
Unemployed	11	5.5
Part-timer	19	9.5
Full-time employee	63	31.3
Total	197	98.0
Didn't answer	4	2.0
Total	201	100.0

Table 8. Respondents' working status

This relative lower proportion obtained empirically is understandable once one considers that all the respondents were pregnant women and that, although by law leave of absence due to pregnancy is enforced in the country, there is a considerable proportion of workers at the national level who are under-employed and do not enjoy those legal benefits. Therefore, some respondents may have had to quit at their previous job or simply waiting for a prudential period of time before taking up their labor activities. (ENEI, 2014) states that 13% of women of the metropolitan are under-employed.

Religion

In the present work 57 variables that were utilized. Among them all religion played an essential role. The way this value was gathered in the present research, contrary to what is seen in mainstream studies, identifies the religious faith for each one of the respondents. Then, not surprisingly, Catholics comprise roughly 50% of the sample and Protestants 40%. These proportions reflect significantly well the religion distribution in the national level. Atheist represented a value slightly over 9% and people whose faith is any other or who simply did not answer account for the remaining 4.5% of the statistical sample.

4.3 GENERAL ANALYSIS

4.3.1 Analysis of Coherence

In the previous sections, it was discussed how the information was initially filtered to discard questionnaires responded by women that did not fit the sample criteria or questionnaires where several of their questions were either left blank or answered in a way that did not make sense. In addition to that process, it is necessary to verify the coherence among the questions of the filtered questionnaires. In order to do this, some redundant questions were added and some closely related questions were considered. The opinion somebody has about spacing pregnancies and the frequency of her use of CMs are a clear and the most important case considered here. As shown in the next scatter plot obtained from the empirical data, there is a satisfactory statistical relationship between what respondents answered they think and what they answered they do.

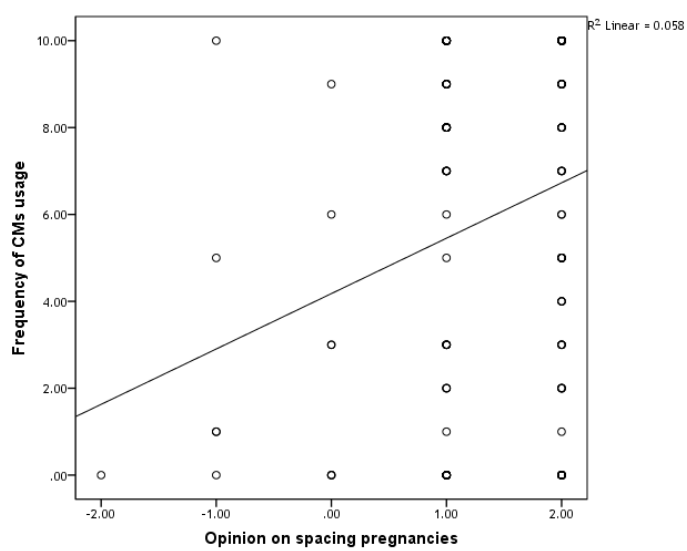

Figure 7. Scatter plot of opinion on spacing pregnancies vs CMs usage

Even though the variable corresponding to the respondent's opinion on spacing pregnancies is not numerical but ordinal (since it is a Likert-scale type variable), the scatter plot does clearly show, what by common sense one could expect, that people in favor of spacing pregnancies use CMs more often than those who do not.

This is especially important since, besides being a way to verify the consistency of the gathered data, it double-checks the answers given regarding the level of the contraceptive usage, or, in other words, the contraception level, which is one of the core concepts of this whole research. It is valid to mention that there are important considerations during the data collection process beyond the statistical methods. Imprecisions from the respondents at the moment of answering the questions is something likely to happen and this could meaningfully affect the data and the conclusions. Then, double-checking their answers results useful when trying to minimize the human-induced statistical error.

4.3.2 Correlations using the Exogenous Variables

As discussed and showed in the section 3.3, four groups of variables were considered. Three of them comprised by exogenous variables which by their specific function are used to either describing the general profile of the female respondent, assessing her religious faith, or assessing other of her aspects that are commonly accepted as explanatory variables of contraception prevalence in a society.

After having validated the coherence of the collected data, the exogenous variables which according to theory are more likely to explain contraceptive prevalence and related concepts were subject of a correlation analysis against the main endogenous variables in order to find the best predictors.

These exogenous variables were also analyzed among themselves with the purpose of finding a strong correlation between pairs of independent variables, which would statistically represent a multicollinearity problem or, in other words, the potential existence of confounding variables with no statistical value at the moment of constructing a statistical model explaining the levels of contraceptive prevalence in Guatemala City.

The following table shows two of the independent variables which, according to theory, were initially thought to be able to explain well the contraceptive prevalence in the city. As for *education level*, it was on one hand, satisfactory to observe the consistence of the information given that, as expected, it is positively correlated with the place of birth. As it was discussed in the Chapter 2, there is an evident educational gap between Guatemala City and the rest of provinces of the country. Also, not surprisingly, *education level* was strongly correlated with the working status. This all goes hand in hand with the theory and even supports the *Gender Equality* fertility rate theory which states that the more opportunities the female gender has the less likely it is to desire a large number of offspring.

		Correlation	Significance
Education level	Born in Guatemala City?	**.153***	**.039**
	Civil status	**-.144***	**.050**
	Working status	**.220****	**.003**
	How many kids wishes to have	**-.240****	**.001**
	Opinion on spacing pregnancies	.135	.065
	Against or In favor of CMs	.141	.052
	Frequency of CMs usage	.053	.501
Civil status	Education level	**-.144***	**.050**
	How many kids wishes to have	**.263****	**.000**
	Opinion on spacing pregnancies	.059	.408
	Against or In favor of CMs	.015	.835
	Frequency of CMs usage	.061	.430

Table 9. Weak exogenous variables

Interestingly, although *education level* does show a significant level of correlation against the desire of having children, it does not influence the final decision of how often they use the CMs. At first glance it might seem a contradiction but it is also valid to say that desires and decisions do not go hand in hand in numerous circumstances of human life. Therefore, it is possible to figure out that there is a third factor or factors that prevent the ultimate decision to make use of the CMs regardless of the desire of reducing the number of children in the family.

Considering that the variable to be explained is not about preferences but about the actual use of CMs, *education level* becomes a weak explanatory variable. Similarly, the variable *civil status* is not statistically correlated with the frequency of use of CMs but, just like *education level*, it is highly correlated with the number of children a woman desires to have. Again, this statistical behavior suggests the existence of a third element that makes the difference between the desire of having children and the actual decision of having them.

Both *education level* and *civil status,* being categorical variables, were analyzed by using the Spearman Rho correlation test. Similarly, *working status* was analyzed by using the same test, but contrary to the former ones, it turned out being strongly statistically correlated with the frequency the respondents use CMs.

It resulted that *working status* together with *Age,* a ratio-type variable, showed the best correlation levels against the frequency of use of CMs. Interestingly, as for *working status* and the desire of having children, results did not show any statistical correlation being so exactly the opposite case of *education level* and *civil status* variables which did show statistical correlation against the desire of having children but not against the level of use of CMs.

Although *age* is strongly and positively correlated with the number of children that the respondents said they want to have, *working status* does not, as it is shown in the following table. This finding reinforces then the presumption that desire for having more children in a family is independent from the actual decision of how many children that family will have.

		Correlation	Significance
Age	Working status	**.181***	**.011**
	How many kids wishes to have	**.313****	**.000**
	Opinion on spacing pregnancies	-.020	.776
	Against or In favor of CMs	**.139***	**.049**
	Frequency of CMs usage	**.356****	**.000**
Working status	Age	**.148***	**.039**
	Education level	**.220****	**.003**
	How many kids wishes to have	-.039	.584
	Opinion on spacing pregnancies	.060	.406
	Against or In favor of CMs	.126	.077
	Frequency of CMs usage	**.279****	**.000**

Table 10. Strong exogenous variables

The positive strong correlation between *age* and the opinion on being either in favor or against the CMs indicates a general pattern among women (and very likely among men as well) regarding how their perception on contraceptive methods evolves over the time. Certainly the correlation is not as high as the one that exists with the frequency of use of CMs but this correlation would at least reinforce the link between the age of the respondents and the level of usage of CMs they have.

4.3.3 Correlations of Endogenous Variables

Besides *frequency of CMs usage,* in order to contrast and validate respondents' answers and to have a better understanding on their points of view regarding contraception, three more endogenous variables were considered. 1) How many children does a woman wish to have in her life time? (this number might be the same number of children she had at the moment of the interview), 2) What's their opinion on spacing pregnancies? 3) How in favor or against of using contraceptive methods she is? These variables were correlated among themselves and the most notorious findings are shown in the following table.

		Correlation	Significance
Against or In favor of CMs	How many kids wishes to have	-.030	.677
	Opinion on spacing pregnancies	**.251****	**.000**
	Against or In favor of CMs	1.000	
	Frequency of CMs usage	**.451****	**.000**

Table 11. Correlations between endogenous variables

The endogenous variable *opinion on spacing pregnancies* did not show any statistical correlation against any of the other endogenous variables. Similarly, *how many kids wishes to have* resulted being not correlated against the rest of endogenous variables. These two findings, contrast with the fact that the opinion on being either in favor or against CMs does matter in the level of contraceptive usage. This all results in one more evidence that supports the division between the desire of having more children and the decision of actually having that number of children.

4.3.4 Catholic faith

As discussed over the previous chapters, it is the purpose of the present work to measure the degree of influence of the Catholic faith in the contraceptive prevalence. This key variable, religion, was correlated against all the endogenous variables and it turned out that this variable showed a statistical correlation only against the level of usage of contraceptive methods, not against any other endogenous variable.

To determine how well the religion variable alone could explain the frequency of the usage of CMs a regression analysis was done, obtaining a R square value of 0.032 with a significance level of 0.064. Despite the low level of explanation that the variable *religion* has on the frequency of use of CMs, it is important to notice the behavior of the dummy variables comprising *religion*.

Given the social and religious characteristics of Guatemala City, three options regarding religion were considered: being catholic, being protestant (or evangelical) and being atheist (more information on the Appendix B). Interestingly, as it shown on the following table, when taken *catholic* as the dummy variable of reference, the corresponding beta value of *protestant* is almost zero and is not even statistically different. On the contrary, atheists do have a different behavior from both Protestants and Catholics by using CMs 24% less than their counterparts.

	B	Significance
(Constant)	6.315	.000
Protestant	-.102	.874
Atheist	-2.432	.022

Table 12. B values - Religion vs CMs frequency of use

It is not surprising that people without a religious background employ CMs in a different way than religious people but the question to be answered here is why atheists employ contraceptive methods 24% less than the religious respondents. In fact, according to theory, and one of the assumptions of the present work is that Catholic believers do not utilize CMs and, if they did, they would use these methods way less than Protestants and especially less than people who have not been indoctrinated against family planning methods. (This question is to be discussed in the *Defining the model* section.)

Religious Composite Variable

More often than not measuring concepts in social sciences is a hard endeavor. From the research design of the present work it was expected that properly measuring the devotion of a given person to Catholicism would imply more than just asking the religious he or she feels identified with. With this purpose, the design of a composite variable comprising a set of core Catholic concepts. For each respondent, it was asked, besides the religion she has, whether she had a Catholic marriage, whether she had celebrated a first communion (two of the seven sacraments instituted by the Catholic Church) and how often she listens to religious messages by either radio, TV or any other communication media. The calculation of this religious composite variable (RCV) was obtained by the addition of the following 4 independent variables (see Chapter 3 and Appendix C for the explanation of them).

$$RCV = \textit{catholic marriage} + \textit{catholic religion} + \textit{first communion} + \text{messages}$$

where the first three variables are dummy-type variables having a value of 1 in the case the respondent gave a positive answer, and, in a different way, *messages,* a

Likert-type variable, representing how often the respondent listens to religious messages in a scale ranging from 0 to 4 according to the answer.

Once the information gathered in the questionnaires was stored in the SPSS database, in order to avoid missing values, these variables were converted into new dummy variables whose missing values were considered as zero (where zero represents a negative answer). The variables and their corresponding SPSS names are as follows.

- *catholic marriage*, mat_catolico_D
- *catholic religion*, religion_Cat
- *first communion*, pri_comunion_D

As for *religious messages* (men_religiosos) it was left without further changes considering it is a Likert-scale variable. When calculating the RCV composite the values of *religious messages* were directly used. Certainly, this assumption, which favors simplicity rather than accuracy, could represent a source of error in the calculation of the composite variable. Further considerations are advisable to verify the proper weighting of this variable.

After evaluating the RCV composite variable, it proved not to be statistically correlated to any of the endogenous variables, not even to the frequency of use of CMs. It showed a large statistical correlation (Spearman coefficient of -0.810 and significance of 0.000) just against the variable *religion*, something natural, considering it is *religion* from which the composite variable derives part of its value.

4.3.5 More Composites Variables

A composite variable that could quantify the general knowledge that respondents have about main contraceptive methods was also calculated, *knowledge composite* (KC). It was calculated by using the following formula. A total of 8 dummy variables were used to compute this composite.

$$KC = MP + MTC + MNP + MI + MC + MP + ME + MO$$

Each of the dummy variables indicates that the respondent affirmed being aware about the existence and usefulness of the corresponding contraceptive method. The correspondence between these dummy variables (as found in the SPSS database) and the CM they represent is as follows.

Var	Method	Var	method
MP	Contraceptive pills	MC	Condom
MTC	Copper T	MP	Patch
MNP	Norplant	ME	Esteril
MI	Injections	MO	Another method

Table 13. Components of the KC composite

Unlike the religious composite variable, the weighting of the component values of the KC composite was straightforward. Under the assumption that having knowledge on one method is equally important than having knowledge on any other method there is no need to verify the proper weight of each of the dummy variables. Therefore, a respondent stating having knowledge about none of the contraceptive methods would signify a mathematical zero whereas somebody having knowledge on the seven options would mean 7, with a potential 8 in case she has answered she remembers an additional method.

After calculating and observing the values of the composite, the results were far from a valid explanatory variable. The distribution of the values of this *knowledge composite* was not even statistically normal, being bimodal, as shown in the following graph. As already mentioned, the calculation of the values of this composite was straightforward, without modifying the weight of any of its components. The bimodality was then not a result of the calculation.

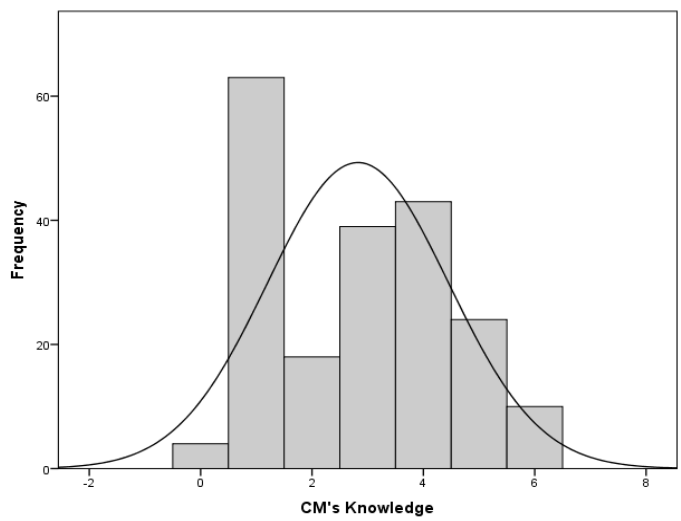

Figure 8. KC composite variable distribution

A regression analysis, despite the absence of normality of the composite variable, was also done between this variable and the endogenous variable *frequency of usage of CMs* but the results, as expected, indicated an R square value virtually non-existent with no statistical significance (0.910). In other words, the association of the knowledge about different contraceptive methods did not explain in any way how often respondents employ them. The poor result can be explained by the fact that, as shown in the previous graph, the vast majority of respondents have knowledge on at least one contraceptive method.

Besides *religion composite* and *knowledge composite,* a social composite variable (SC) was considered. In a similar way to *knowledge composite*, SC is comprised by the sum of only dummy variables, three in total, as shown in the next formula.

$$SC = met\_pareja + met\_padres + met\_a\_pena$$

This is called a social composite since it takes into account three different aspects of the social life: influence received by the partner *met_pareja,* influence received by the parents *met_padres*, and a more personal aspect, the degree of timidity of the respondent regarding the use of a contraceptive method, which, in turn, is assumed to be a result of the influence of society in general. For this calculation, it has been assumed that the three different social aspects are equally important. It is arguable that any of them has a heavier weight than the other two although it would go beyond the scope of the present work.

Contrary to the *KC composite,* this *SC composite* did show a normal distribution. Nevertheless, when a regression analysis against the level of usage of CMs was done the obtained R square was a flimsy 0.005 with a significance level of 0.392.

In short, none of the three composite variables could statistically explain the level of the usage of CMs with any level of significance. Although the adequate selection and weighting of each of the components of each composite variable could be subject to a further analysis it is valid to say that the poor results derived from them do not represent a contradiction against the mainstream theories, which value more other aspects not included in the composite variables. (Further discussion in Chapter 5).

4.3.6 Defining the model

From the correlations section, it is known that both *age* and *working status* are the best statistically correlated independent variables with *CMs usage*. Similarly, from the previous section it was possible to deduct that none of the three proposed composite variables can statistically explain *CMs usage.* In fact, from the religious perspective, the categorical variable *religion* is better correlated with *CMs usage* than the *religious composite* one. Pondering this all, the first model to consider includes only the best explanators, as follows.

$$\text{CMs usage} = \text{age} + \text{working status} + e \qquad \text{(Model i)}$$

Since *working status* is a categorical and not a numerical variable its corresponding dummy variables were used: *unemployed*, *housewife*, *part-time* and *full-time*, taking as reference the first of them. Alongside, the numerical variable *age* was included and, after calculating a linear regression the obtained adjusted R square value is 0.179. with the statistical perfect significance of 0.00. Then, the corresponding beta values for each of the *working status* dummy variables and *age* variable are as shown in the following table.

	B value	Significance
(Constant)	-.593	.712
Age	.193	.000
housewife	.579	.618
part-time	3.896	.007
full-time	2.017	.098

Table 14. Model i beta values

Based on the level of significance of *age*, which is by far the strongest of the variables, it is valid to state that women make more use of CMs over the time with

an increase rate of around 10% every 5 years. Not a drastic but statistically clear pattern which makes much sense from a pragmatic point of view as women for the most part decide not having more children before their reproductive lives come to an end. It is, an older woman, is less likely to desire having an additional child since she might have already given birth to other children and she might also be more aware of health-related complications. The following scatter-plot graph, obtained from the sample, clearly backs up the increasing trend in the usage of CMs according to the age of a woman.

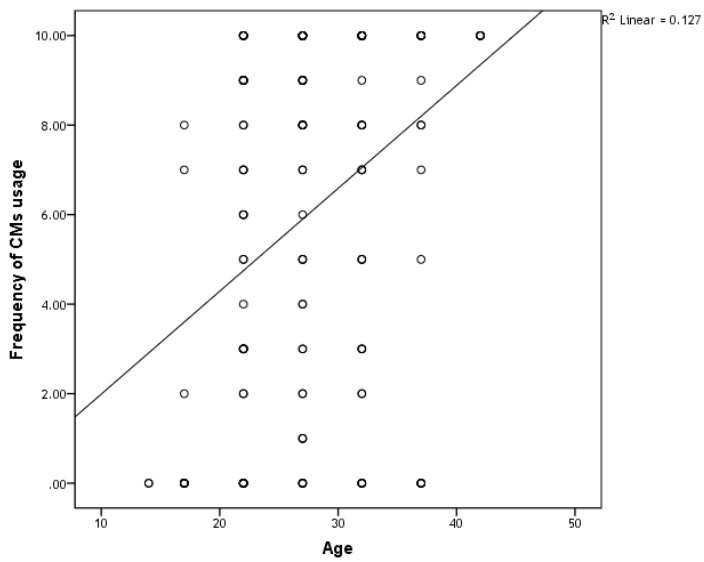

Figure 9. Respondent's age vs Usage of CMs

The *working condition* factor, although less evident than *age*, is also able to statistically explain the frequency of use of CMs in the sample. For interpreting this, it is necessary first to remember that 4 conditions (dummy variables) were considered, among which *unemployed* was the reference dummy variable. Interestingly, both *part time* and *full time*, conditions that imply the respondent's involvement in working activity were statistically significant. On the contrary, the *housewife* condition that, in terms of being employed, just as *unemployed,* implies

the no existence of labor duties, was not significant. It is, when explaining the frequency of use of CMs, the working condition factor could be narrow down to just two main categories defined by the engagement or not of the respondent in labor activities.

It is also important to notice, as shown in the previous table, that part-timers make a more extensive use of CMs than even those with full-time employments. The rate of usage of the formers is almost the double and this is understandable when considering that their financial situation is less stable than that of their counterparts. A part-timer, or a sub-employed woman, is less likely to enjoy the pregnancy privileges that, by law, a full-employed woman enjoys. On the opposite case, a woman enjoying a stable and protected job is less worried about the financial implications having a child has.

As for the *religion* factor, it turned out to somewhat explain the CMs usage frequency but there are still two aspects to explain: 1) as mentioned in the *Catholic faith* section, why, contrary to expectations, atheists make less use of CMs than both Catholics and Protestants? and 2) as shown in the previous section, the low value of the R square coefficient. Considering these two factors, it is probable that it was *education level* behind *religion* and not *religion* itself explaining the changes in the CMs usage frequency. In other words, one could argue that the atheist respondents might have had a lower schooling than the other respondents.

	Partial Elem.	Elementary	Secondary	Other	Total
Catholic	12	13	44	26	95
Protestant	8	14	23	28	73
Atheist	1	4	7	4	16
	21	31	74	58	184

Table 15. Crosstab: Religion vs Education Level

However, as shown in the previous crosstab table, atheist respondents did not happen to have an education lower than their religious counterparts. Proportions do not show a visible difference. Moreover, given the categorical nature of both variables, a Chi-square test of independence was conducted. Given the Pearson Chi-Square equal to 6.064 at a significance of 0.416, not enough to reject the null hypothesis of no association between the two variables., as expected, the variables are independent and therefore it is valid to conclude that *Religion* is not statistically a consequence of the *education level* of the respondents.

Once determined that *religion* is independent from *education level*, a possible answer to the two aspects previously mentioned could be *religion* being explained by the *age* of the respondents. Thus, a correlation analysis between *religion* and *age* was performed and the resultant R square was -0.244 with a 0.01 significance level. *Religion* and *age* are inversely correlated, being the mean age of the atheist respondents around 22 and the age of both Protestants and Catholics around 28, based on the tabulated data of the sample. Atheist respondents were statistically younger than the other two groups and this explains why, contrary to expectations, atheists answered to use CMs less frequently than the religious people.

Given that both *age* and *working status* explain statistically well the CM usage frequency, and considering that *religion* and *age* are correlated, it is convenient to test how well *working status* and *religion* (without *age*) can explain the CMs usage frequency. In the case these two independent variables cannot explain the CMs usage one could rule out the explaining value of *religion* and confirm the explaining contribution of *age*. The alternative model would be as follows.

CM usage = Working Status + Religion + e (Model ii)

After using a linear regression analysis in SPSS to evaluate the model ii, the value of the adjusted R square was 0.137 with a statistical significance of 0.000. Compared to the model i, where *age* was used instead of *religion*, although having the same significance, this model is worse off going from down an adjusted R square of 0.179 to 0.137. Moreover, when analyzing the beta values of the dummy variables corresponding to *religion* only *atheist* has statistical difference, as shown in the following table. This confirms the finding that the dummy variables *protestant* and *catholic* are not statistically different each other. *Religion*, therefore does not improve the model explaining the CMs usage frequency.

	B value	Significance
(Constant)	4.429	0
housewife	1.061	0.383
part-time	4.891	0.001
full-time	2.717	0.032
Protestant	-0.179	0.77
Atheist	-1.997	0.05

Table 16. Model ii beta values

After observing the results of the two previous models, a third one, comprising *age*, *working status* along with *religion*, as shown in the following formula, was analyzed. A regression analysis was used and the adjusted R square value resulted being 0.173, almost identical to the 0.179 adjusted R square value yielded by the first model. In other words, the adjusted R square value was higher once again after having included *age* again in the model. Based on this it is able to conclude the non-relevance of the *religion* factor in the model explaining the frequency of CMs usage. Interestingly, in this third model, the inclusion of *age* eliminates the significance of the dummy variable *atheist*, which represents the complete irrelevance of *religion* in the model.

CM usage = Age + Working Status + ~~Religion~~ +e (model iii)

CHAPTER 5: CONCLUSIVE DISCUSSION

Each country is different and, therefore, solutions in order to reach its own desirable TFR cannot be expected to be equal. In words of (MacDonald, 2002) “There can be no single cross-national model for success. Each country must seek its own institutionally appropriate approach. Also, each country must deal with the realities of its own political economy.” The empirical data of the present work, entirely collected in the capital city, and its corresponding findings, are used in the following sections to contrast theory, much of which has been obtained from experiences in other countries and contexts. Additionally, since differences are not only among countries but also within them, the insights and conclusions from this work are not expected to be generalized to the countryside of Guatemala, specially to the rural areas.

5.1 Theory and Demographics

According to the National Maternal Health Survey (MSPAS, 2011), the most authoritative publication on fertility rate and family planning in Guatemala, at the national level each woman is expected to have 3.6 children during her lifetime. At the national level, but considering only those living in urban areas the TFR is 2.9 and, as expected, considering only the rural areas the TFR is 4.2. As for the collected data, the average number of children the respondents said to have is 1.48 but it is important to notice that most of them are still expected to deliver more children in the future. For this reason, it is not the average number of children they currently have what matters but the average of the total number of children they wish to have, which, based on the data, is 2.47. Clearly, this is a satisfactory result that does not go

against official demographics. There is a difference of 0.43 but this is completely understandable since the empirical data was collected not in urban areas in general but only in the capital city, where the TFR is expected to be even lower.

As explained in the Chapter 2 of the present work, Guatemala is a multi-ethnical country where around 41 percent of the population is Mayan descent and are able to speak an indigenous language in addition to Spanish. The vast majority of them live in the countryside in the rural areas of mainly the western highlands and the northern region. Among the interviewed women just 11 answered to be able to be bilingual. Their corresponding data was not taken into account since it was one of the control variables. Considering the size of the statistical sample, from a demographic point of view they comprised a low 5 percent. The explanation for this meaningful difference obeys to 2 main factors: 1) the percentage of bilingual people in the capital city in considerably lower, 2) as explained in the Chapter 3, speaking a Mayan language is for some parts of the society a potential reason of discrimination and because of this some respondents might have denied her faculty to speak a second language.

According to (Grace, 2008) the percentage of women in a union making use of contraceptive methods at a national level was around 54% as of 2010. The official numbers provided by (MSPAS, 2011) say that in the urban area 54.6% of women in a union make use of a contraceptive method and that 79.7% of those women in union have ever used one. As for the empirical data, levels of usage of CMs are basically the same. The 20.9% of the respondents affirmed not using CMs at all, it is, 79.1% have, at least in a specific opportunity, used them. Although this number does not distinguish civil status, all the respondents were pregnant and therefore they were or had been in a union relationship. On the other hand, the 33.7% of respondents answered using always CMs (they were given the option to rate their frequency of

use, being zero equivalent to never and ten, the maximum value, equivalent to always). This proportion of steady users is not far from the 54.6% of women that make use of CMs according to official statistics since the official criterion was regular use and not steady use. It is then possible to say that there is no contradiction in general terms against official data.

Although the demographics of the collected data in general are discussed in the Section 4.2, the previous considerations, presented with the aim of proving the harmony between the statistical findings and official numbers, show the plausible core values of the statistical sample such as TFR and CMs usage. It is important then, to contrast the statistical results of the collected data against what theories say.

5.2 Theory and Findings

First, although contraceptive access is considered as one among the potential reasons of low contraceptive prevalence, since the beginning of the present work this reason was ruled out, as mentioned in the Chapter 3. Still, this factor was included in the questionnaires and, as expected, empirical data confirmed the expectations, since 97.5% answered that CMs are not hard to get. This agrees with authors like (Pritchett, 1994) who claim and show evidence that fertility is mainly determined by the desire for children and not for the contraceptive access.

In Chapter 2 several theories and factors explaining fertility rates and contraceptive prevalence were presented. Four non-mutually exclusive theories are of special interest in the present work: Rational Choice, Risk Aversion, Post-Materialist Values and Gender Equity theories.

According to the *Rational Choice Theory*, as explained by (MacDonald, 2002), people make the considered calculation that the benefits of an additional child outweigh the costs. On one hand, costs are mostly financial and benefits are mainly psychological, not readily quantifiable. However, this theory would not be able to explain by itself fertility rates in Guatemala since the economic cost of an additional child does not enter in the formula in the mindset of thousands of low income workers who care more about their own future economic safety rather than the quality of life they currently have or the necessities the coming member of the family should undergo.

A problem with this theory is that it is assumed that that people have a reasonably good knowledge or understanding of the costs and benefits of having the next child. What about illiterate people whose education is restricted to what his/her father and mother tell them to do? What if somebody is raised by a third person with little or no education? Rational choice seems not to make much sense in areas like the western highlands of Guatemala where one out of five people cannot even read and write. As (Casterline, 2010) states "Formal schooling is second only to mortality as a determinant of fertility."

On the other hand, considering not the situation of the whole country but just the empirical data of the capital city, results for *education level* are negatively and highly correlated with the desire of having children (See table 9). This finding supports the assumption that people are rational.at the moment of deciding having an additional child, but it also has to be mentioned the evident better education there is in the capital city, where according to the collected data, just the 9% of the sample answered having no education. Better educated people are able to rationalize better their family-related decisions.

The core question of the present work was whether Catholic faith can explain contraceptive prevalence. In the present context, it does not (Table 12). The variable *religion* cannot either statistically explain the opinion of people on contraceptive methods. It was possible, however, to determine that contraceptive prevalence among atheists is lower than among religious people. This finding which does not match expectations, as discussed in the Section 4.3.6, was indeed explained by the *age* variable. *Age* turned out being an excellent explanatory variable. People growth mature as they grow older (exceptions there might be) and then it is valid to say that people become "more rational" as they grow older. Considering this all, *rational theory* and *age* explaining contraceptive prevalence end up supporting each other.

Risk Aversion is another theory trying to explain fertility rates. This theory highlights the desire of people to investment in economic security. It is important to notice that risk aversion might also be applied to the social, intimate, or personal spheres. There is a risk that children will disrupt the relationship between the parents. There is a risk that children will follow pathways that cause parents considerable anxiety. There is a risk that some harm will come to the child. There is a risk that the relationship will break up and the mother (or sometimes the father) will be left alone to support the child.

The theory seems to be consistent in the sense that people aim at safety. However, from a more practical perspective, the theory is ambiguous about the human behavior. One person, seen through the glass color of this theory, desires having more children in pursue of his personal future safety while another person desires having no children or having a fewer number due to concerns over his/her children themselves. It is then necessary to clarify that in the context of the present work *risk aversion* is understood as the pursue of a safe retirement, in other words, avoid the risk of sentimental or financial hardships in the third age.

Once clarified the theory, compared against the empirical results it does not result completely satisfactory, not in this case. *Education level* is negatively correlated against *how many kids* the respondents want to have (see Table 9). Better education means a better future is more likely in financial terms, however more educated people answered having desire for fewer children. Similarly, although *civil status* resulted statistically correlated against *how many kids wishes to have*, in the corresponding regression analysis the calculated adjusted R square was too low and the beta values indicated that single women desire having 0.6 fewer children than those in free union. It contradicts the risk aversion theory, according to which single mothers might try to ensure a better future. One could argue that a single mother would actually desire having more children to guarantee herself a better future but does not do so since her current condition restricts her. However, such a statement acknowledges a rational decision from the mother. In other words, *rational choice* would better explain the empirical evidence rather than the risk aversion theory.

Although beyond the limits of the present work, on the macro-level however, this theory helps to explain the general reticence of low income people towards the use of family planning methods. Although explained by some theorist as a cultural phenomenon, cultural phenomena also must occur due to a reason. For the most part, this reason might be related to health concerns, religious beliefs and also the procurement of a better third-age, risk aversion.

The *Post-materialist values* theory explains that within any society, on average, individual women who are more highly educated, less religious, more urban, or more liberal in their attitudes and values have lower fertility than those who are less educated, more religious, more rural and more conservative.

This theory is of special interest since it is the one among mainstream theories which best support the core hypothesis in the present work, that Catholic doctrines hamper the contraceptive prevalence in the society and therefore its fertility rate. The empirical evidence, however, indicate something different. Neither the *religion* variable nor the *religious composite* variable could explain neither the *desire for children* nor the *contraceptive prevalence* in the statistical sample. It is necessary, however, to stress the fact that data was only gathered among residents of the capital city or at least with the capacity to get medical healthcare in there. This acted as an excellent control variable that contributed to homogenize the sample but this sample represents, according to theory, the most educated, urban and liberal area of the country.

The sample's demographics match with official numbers (Section 4.2) and they make sense against numbers found in other sources (Section 5.1). The sample constitutes a fairly homogenized one, as it was intended, but it is not representative of the whole country. The collected data corresponds to only one sector of the population and it is likely to be the reason why a well-established theory does not make any sense against the results of the sample.

It is possible to contrast two very different scenarios. On the macro-level (Section 2.1), statistics clearly show how the higher the degree of education and income of a certain population is the smaller its TFR becomes (Figure 1). On a far more reduced scale, as is the case of the present work, the sample is rather homogenized and those patterns are not possibly found.

According to sources documented also in the Section 2, "Development is the best contraceptive". This idea seems to agree at a certain extent with the *post-materialist values* theory considering that education and development go hand in hand. However,

once again, this phenomenon is not visible in the present work. On the contrary, results from a wider sample, including both urban and rural scenarios throughout Guatemala, would likely confirm this assumption since at that level both cultural and development levels are quite diverse.

The *Gender Equity* theory, the fourth one, explains that if women are provided with opportunities nearly equivalent to those of men in education and market employment, but these opportunities are severely curtailed by having children, then, on average, women will restrict the number of children that they have. Empirical results confirm this theory. The best explanatory variables of contraceptive prevalence were *age* and *working status* (Table 14). Although the theory that best supports the behavior of the *age* variable is *rational theory,* it is *gender equity* which best lays the theoretical foundation supporting the fact that *working status* explains contraceptive levels in the sample.

Among the four dummy variables comprising *working status*; *housewife* and *unemployed* were statistically similar to each other, in the same way as *part-time* and *full-time* were similar among themselves. In other words, working women, with goals and financial interests and responsibilities, reported a more proactive behavior regarding contraceptive methods, and non-working women a more passive one. In fact, according to empirical data, working women reported a contraceptive prevalence up to 7 times higher than the non-working ones.

Female labor force participation is in fact a factor that several authors consider as an important explanatory variable of contraceptive prevalence. This, however, could be incomplete if another key variable, pension systems, was disregarded.

Although not relevant in the present work due to the homogeneity of the sample, the pension system is an important factor that explain contraceptive prevalence among different regions (having different retirement plans). As discussed in the Section 2.3, the welfare system in general has been important factor in Europe explaining the differences in TFR among countries. In the comparison between Italy and Sweden, it would be expected that Sweden had a lower TFR being a more liberal country (*post-materialist values)*, moreover female labor force participation is not lower than the one found in Italy *(gender equity theory)*. Nevertheless, statistics proved the contrary. The reason, as provided by (Chesnais, 1996), is the significantly better pension system, and welfare system in general, in Sweden. Precarious job opportunities have dissuaded Italian families from procreating a bigger number of children.

Although not applicable to the present case, it is valid to mention that third external factors, such as satisfactory pensions and improved protection to working conditions could affect in the future the fertility rate and contraception prevalence among those *full-time* and *part-time* working mothers in Guatemala City.

5.3 Summary of Relevant Factors

The hypothesis driving the present work, that Catholic faith hampers contraceptive prevalence in the lower working class of Guatemalan City society, proved not to be true. At some extent, the contraceptive prevalence in the statistical sample could be explained but by the *age* and *working status* variables, as discussed in the previous sections. The obtained model that could best explain CMs usage is, as discussed in the section 4.3.6, as follows.

$$\text{CMs usage} = \beta_0 + \beta_1 \text{ age} + \beta_2 \text{ working status} + e$$

According to the beta values of the model (Table 14), as age increases so does the frequency with which a woman makes use of contraceptive methods. Among mainstream theories, the *rational theory* strongly supports this finding. If one considers that growing older generally means growing mature or "rational" then it is natural to find out that more mature women take better care of their future. Besides the evident factor that older women have on average delivered more children than younger women and therefore the *fertility demand side* decreases, older women are, for the most part, more conscious about their relative limitations due to age.

The *working status* of a woman resulted being the other best explanatory variable of contraceptive prevalence. Among the 4 working options considered, when taking *unemployed* as the reference, both *part-time* and *full-time* (the options that represent working activity) turned out being statistically significant and different from *unemployed* whereas *housewife* resulted being no statistically different from *unemployed*. Working women reported using contraceptive methods up to 7 times more often than those who were not employed.

The *gender equity* theory clearly supports the explanatory behavior of *working status*. Working women having financial goals and responsibilities weigh differently the costs of having an additional child and therefore contraceptive prevalence among them increases. The obtained model and the corresponding beta values (Table 14) is therefore as follows.

CMs usage = 0.193 age + 3.896 is-part-timer + 2.017 is-fully-employed + e

Among the underlying factors initially considered in the present work (Table 3) only cost-related considerations proved to be significant. Both contraceptive access and method of employment were ruled out from the beginning. Knowledge, health and social norms were tested (Section 4.3.5) but turned out being unable to explain contraceptive prevalence. On the other hand, unexpectedly, age proved to be the best explanator in the rather homogenous sample of the present work.

Given the contrasting differences between Guatemala City and the countryside, mainly the rural areas (Section 2.5), it is not possible to either generalize the conclusions drawn in the present work nor to statistically rule out the influence of the Catholic faith in those regions. Another research would be necessary and then, given the much bigger and more heterogenous sample, theories such *risk aversion* and *post-materialist values* might explain the macro differences.

.

5.4 Recommendations

According to the empirical data, *age* turned out to be the best explanatory variable of contraceptive prevalence and therefore of fertility rates in the statistical sample. It was more important than financial, health and social factors. In other words, it is the understanding women acquire over time, besides the children bearing number, what best explained contraceptive prevalence. Based on this, it is advisable for policy makers, and social leaders in general, to create and improve the social communication mechanisms conveying the importance of contraceptive methods. Improving the understanding women have about contraception from early stages would be vital for reducing the current fertility rates.

Although all the data was gathered in urban areas of the Capital City, based on the general theory discussed in the present work, it is evident that a further and similar research in the rural countryside is highly advisable. Differences in history, culture, race, language and development cannot but support the convenience, if not necessity, of another research whose results can be contrasted against the present work and whose findings help elucidate the influence of the Catholic Church doctrines, and other factors, in those areas.

Along with further similar researches, multi-cultural awareness is crucial to the development of a better Guatemala. From the collected data, the desired TFR in the Capital City was 2.47, an almost optimal level. But this value contrasts against the feeble 18 percent contraception prevalence reported in the rural countryside. This is another reality, but a shared responsibility of all Guatemalan people.

REFERENCES

Babbie, E., 2008. *The Basics of Social Research.* 4th ed. Belmont, CA: Thomson Learning.

Bjorklund, A., 2006. Does Family Policy Affect Fertility? Lesson from Sweden. *Journal of Population Economics,* 19(1), pp. 3-24.

Brewster, K., 2000. Fertility and Women's Employment in Industrialized Nations. *Annual Review of Sociology,* Volume 26, pp. 271-296.

Carolina P Center, 2000. *The Stymied Contraceptive Revolution in Guatemala,* Chapel Hill: University of Carolina.

Casterline, J., 2010. *Determinants and consequences of high fertility,* Washington DC: The World Bank.

Chesnais, J.-C., 1996. Fertility, Family, and Social Policy in Contemporary Western Europe. *Population and Development Review,* 22(4), pp. 729-739.

Cisek, C., 2016. *Diagnóstico del sistema de salud de Guatemala 2016,* Bethesda: USAID.

Coleman, D., 1998. *Reproduction and survival in an unknown world: what drives today's industrial populations, and to what future?,* Oxford: University of Oxford.

ENEI, 2014. *Encuesta Nacional de Empleo e Ingresos,* Guatemala: Instituto

Nacional de Estadistica.

Fenge, R., 2014. *Pensions and Fertility. Back to the Roots,* Frankfurt: Europen Central Bank.

Fenge, R. & Scheubel, B., 2010. *Pensions and Fertility: Back to the Roots,* Rostock: Department of Economics, University of Rostock.

Grace, K., 2008. *Guatemalan Regional Fertility Patterns 1987 - 2002,* s.l.: USAID.

Gramajo, J., 2015. Congreso establece mayoría de edad para casarse. *Prensa Libre*, 5 November.

Guzman, A., 2014. *Bill 4746, Reforms to Act 9-2009 'Law Against Sexual Violence',* Guatemala: Guatemala National Assembly.

Herold, J., 1989. Catholicism and Fertility in Puerto Rico. *American Journal of Public Health,* 79(9), pp. 1258-1262.

INE, 2003. *Censo 2002: XI de poblacion y VI de habitacion,* Guatemala: Instituto Nacional de Estadistica.

INE, 2014. *Encuesta Nacional de Condiciones de Vida,* Guatemala: Instituto Nacional de Estadistica.

Jahan, S., 2015. *The Human Development Index - what it is and what it is not,* s.l.: United Nations Development Programme.

MacDonald, P., 2002. Sustaining Fertility through Public Policy: The Range of Options. *Population-E,* 3(57), pp. 417-446.

MSPAS, M. d. S. P. y. A. S., 2011. *Encuesta Nacional de Salud Materno Infantil 2008,* Guatemala: Instituto Nacional de Estadistica.

Ospina, G., 2015. *Council on Hemispheric Affairs.* [Online]
Available at: www.coha.org

Palamuleni, M., 2014. *Demographic and Socio-economic Factors Affecting Contraceptive Use in Malawi,* South Africa: North West University.

Peri-Rotem, N., 2013. *Religion and Fertility in Western Europe,* Cambridge: University of Cambridge.

Population Division, 2015. *World Contraceptive Use,* s.l.: United Nations, Department of Economic and Social Affairs.

PRB, 2013. *Family Planning Worldwide,* Washington DC: Population Reference Bureau, ICF International.

Pritchett, L., 1994. Desired Fertility and the Impact of Population Policies. *Population and Development Review,* 20(1), pp. 1-55.

Sable, M., 1997. Factors Affecting Contraceptive Use in Women Seeking. *Family Planning Perspectives,* 32(3), pp. 124-131.

Sinding, S., 2000. Unmet Need for Family Planning in Developing Countries.

Population and Development Review, 26(4), pp. 691-723.

Siow, C., 2009. *Family Planning Use in Central America: Closing the Equity Gap,* Washington DC: Population Reference Bureau.

UN Population Division, 2003. *Fertility, Contraception and Population Policies,* New York: Department of Economic and Social Affairs.

UNDP, 2015. *Human Development Report 2015,* Washington DC: United Nations Development Programme.

United Nations, 2015. *World Contraceptive Use 2015,* New York: UN, Department of Economic and Social Affairs, Population Division.

Van de Kaa, D., 1999. The past of Europe's demographic future. *European Review,* 7(4), pp. 529-550.

Van de Kaa, D., 2002. *The Idea of a Second Demographic Transition in Industrialized Countries,* Tokyo: National Institute of Population and Social Security.

Van den Broeck, G., 2015. *Female Employment Reduces Fertility in Rural Senegal,* Cambridge: PLoS ONE.

WHO, 2008. The global family planning revolution. *World Health Organization,* Volume 86, pp. 161-240.

APPENDICES

Appendix A

Summary of the variables utilized in SPSS. Each of the variables correspond to one of the questions or sub questions of the questionnaires (shown in the Appendix B). The *label* column describes the concept of the variable in the questionnaire. The *missing* column indicates the values that were excluded during the statistical analysis for each variable. (The gathered data of the main variables is included in the Appendix D)

Name	Type	Width	Label	Missing
boleta	Numeric	1		None
edad	Numeric	2	Age	-99
len_maya	Numeric	1	Mayan language?	-1
educacion	Numeric	1	Education level	-1, 1
edu_ParElem	Numeric	1	Partial Elementary	None
edu_Elementary	Numeric	1	Elementary	None
edu_Middle	Numeric	1	Middle	None
edu_Other	Numeric	1	Other	None
depto	Numeric	1	Born in Guatemala City?	-1
e_civil	Numeric	1	Civil status	-1
e_civil_Casada	Numeric	1	Married	None
e_civil_Unida	Numeric	1	Free Union	None
mat_catolico	Numeric	1	Catholic marriage?	-1
mat_catolico_D	Numeric	1	Cat Marriage	None
est_laboral	Numeric	1	Working status	-1
est_laboral_ACasa	Numeric	8	housewife	None
est_laboral_SEmpleo	Numeric	8	unemployed	None
est_laboral_MEmpleo	Numeric	8	part-time	None
est_laboral_FEmpleo	Numeric	8	full-time	None
religion	Numeric	1	Religion	-1, 4
religion_Cat	Numeric	1	Catholic	None
religion_Pro	Numeric	1	Protestant	None
religion_Ateo	Numeric	1	Atheist	None
religion_composite	Numeric	8	Religion composite	None

pri_comunion	Numeric	1	Did the first communion?	-1
pri_comunion_D	Numeric	1	First Communion	None
men_religiosos	Numeric	1	How often listen to sermons?	-1
nin_luz	Numeric	2	How many kids has given birth	None
nin_actual	Numeric	2	How many kids has	None
nin_deseo	Numeric	4	How many kids wishes to have	None
met_pastillas	Numeric	1	Knowledge of pills?	None
met_tcobre	Numeric	1	Knowledge of IUC?	None
met_norplant	Numeric	1	Knowledge of Norplant?	None
met_inyec	Numeric	1	Knowledge of injections?	None
met_condon	Numeric	1	Knowledge of condoms?	None
met_parche	Numeric	1	Knowledge of patches?	None
met_esteril	Numeric	1	Knowledge of sterilization?	None
met_otro	Numeric	1	Knowledge of another method?	None
met_antes	Numeric	1	Use of any method before pregnant?	None
met_nat	Numeric	1	natural method?	None
met_mod	Numeric	1	modern method?	None
met_apoyo	Numeric	3	Against or In favor of CMs	None
met_a_dificil	Numeric	1	CMs are hard to get?	None
met_a_religion	Numeric	1	CMs and religion?	None
met_a_salud	Numeric	1	CMs and health?	None
met_a_pena	Numeric	1	CMs are shameful?	None
met_a_aborto	Numeric	1	CMs are abortion?	None
met_a_otro	Numeric	1	CMs other reason?	None
met_pareja	Numeric	1	Is the partner in favor of CMs?	-1
met_padres	Numeric	1	Did parents talk about planning?	-1
met_espaciar	Numeric	3	Opinion on spacing pregnancies	None
met_frecuencia	Numeric	4	Frequency of CMs usage	-1
met_i_dinero	Numeric	1	Would use CMs more often if free?	None
met_i_iglesia	Numeric	1	CMs more often due to church advice?	None
filtro_edad	Numeric	1	edad<30 (FILTER)	None
saber_composite	Numeric	8	Knowledge	None
filter_$	Numeric	1	edad<33 (FILTER)	None
social_composite	Numeric	8	Social effect	None
edad_restrict	Numeric	8	Age 20 - 32	None

Appendix B

Estudio de Métodos de Planificación Familiar

Master Thesis Research - Seoul National University, South Korea

Encuestado No. _____ Loc. _____

Edad <15 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50+

¿Qué idiomas habla? Español ☐ Alguna lengua maya ☐

Nivel de educación Sin educación ( ) primaria incompleta ( ) primaria ( ) secundaria ( ) otro ( )

Depto. de nacimiento _____

Estado civil Soltera ( ) Casada ( ) Unión Libre ( ) Divorciada ( )

¿Matrimonio católico? Sí ( ) No ( )

Estado laboral Ama de casa ( ) Sin empleo ( ) Trabajo medio tiempo ( ) T completo ( )

Religión Católica ( ) Evangélica ( ) Sin religión ( ) otro ( )

¿Hizo su primera comunión? Sí ( ) No ( )

¿Qué tan seguido escucha mensajes religiosos (en la iglesia, radio, TV, etc)?

Nunca ( ) Rara vez ( ) Una vez al mes ( ) Una por semana ( ) Más de una por semana ( )

¿Cuántos niños ha dado a luz? 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | más

Número de niños actual 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | más

¿Cuántos niños desea tener? 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | más

Planificación Familiar

¿Sobre qué método anticonceptivo moderno conoce usted?

Pastillas ☐ T cobre ☐ Norplant ☐ Inyección ☐ Condón ☐ Parche ☐ Esterilización ☐ otro ☐

¿Utilizó algún método antes del embarazo actual? Sí ( ) No ( )

Método natural [como el ritmo] ( ) Método moderno ( )

¿Cuál es su opinión acerca de los métodos anticonceptivos?

Muy en contra ( ) En contra ( ) Me da igual ( ) A favor ( ) Muy a favor ( )

Difícil de conseguir ☐ Por religión ☐ Por salud ☐ Por pena ☐ Lo considera aborto ☐ otro ☐

¿Su pareja está de acuerdo en el uso de algún método? Sí ( ) No ( )

¿Sus padres le hablaron antes sobre planificación familiar? Sí ( ) No ( )

¿Qué opina sobre espaciar los embarazos?

Es muy malo ( ) Puede ser malo ( ) Me da igual ( ) Puede ser bueno ( ) Es muy bueno ( )

Frecuencia de uso de anticonceptivos: Nunca 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 Siempre

¿Utilizaría más los métodos de planificación familiar si fueran gratis? Sí ( ) No ( ) Ya son gratis ( )

¿Utilizaría más los métodos de planificación si su iglesia los recomendara? Sí ( ) No ( )

Muchas gracias por su tiempo y cooperación. La información recabada se utilizará con fines estrictamente académicos.

Original questionnaire. Small-scaled at 75% of the original size.

Study on Family Planning Methods

Master Thesis Research - Seoul National University, South Korea

Person No. _____ Location _____

Age <15 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50+

Spoken language(s) Spanish ☐ Any Mayan language ☐

Education level No education ( ) partial elementary ( ) elementary ( ) middle ( ) other ( )

Province of birth _____

Civil status Single ( ) Married ( ) Free Union ( ) Divorced ( )

Catholic marriage? Yes ( ) No ( )

Working status Housewife ( ) Unemployed ( ) Part-timer ( ) Fully employed ( )

Religion Catholic ( ) Protestant ( ) Atheist ( ) other ( )

First communion? Yes ( ) No ( )

How often do you listen to religious messages (at church, on radio, TV, etc)?

Never ( ) Seldom ( ) Once a month ( ) Once a week ( ) More than once a week ( )

Number of delivered children? 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | more

Current number of children? 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | more

Desired number of children? 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | more

Family Planning

What modern contraceptive method do you know about?

Pills ☐ IUC ☐ Implant ☐ Injection ☐ Condom ☐ Patch ☐ Sterilization ☐ other ☐

Did you use any CM before the current pregnancy? Yes ( ) No ( )

Natural method [like rhythm] ( ) Modern method ( )

What's your opinion about modern contraceptive methods?

Really against ( ) Against ( ) Indifferent ( ) In favor ( ) Really in favor ( )

Hard to get ☐ Due to religion ☐ For health ☐ Embarrassment ☐ It's abortion ☐ other ☐

Does your partner agree to use any method? Sí ( ) No ( )

Did your parents talk to you about family planning? Sí ( ) No ( )

What's your opinion about spacing pregnancies?

It's bad ( ) It may be bad ( ) Indifferent ( ) It may be good ( ) It's good ( )

Frequency of use of CMs: Never 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 Always

Would you use CMs more often if they were for free? Yes ( ) No ( ) They're already free ( )

Would you use CMs more if your church recommended them? Yes ( ) No ( )

Thank you for your time and cooperation. The gathered information will be exclusively used for academic purposes.

English translated version. Small-scaled at 75% of the original size.

Appendix C

Explanation of each question of the questionnaire, ordered by group.

Group 1. Profile Questions

Age		How old are you?	
Type of data	Type of question	Function	Notes
Interval	Closed-ended	Exogenous	Intervals of 5 years

The very first question in the questionnaire. It is used as control variable. Due to the social female sensibility and pragmatism, rather than asking the actual age of the respondents they were simply asked to identify the age bracket they belong to.

Spoken languages		Do you speak any Mayan language?	
Type of data	Type of question	Function	Notes
Dichotomous	Closed-ended	Exogenous	control var

Guatemala is a multicultural and multiethnic country where race usually entails a specific socio-economic position. This variable, as all the other dichotomous variables used in this work, correspond to closed-ended questions in the questionnaire represented by a checkbox (yes or no type answers).

Education level		What's the highest degree you achieved?	
Type of data	Type of question	Function	Notes
Ordinal	Closed-ended	Exogenous	5 categories; control var

There are 5 categories considered: no education, partial elementary education, full elementary education, middle or secondary education, and 'other' (in case the respondent has attained any degree granted at university level).

Province of birth		Where were you born?	
Type of data	Type of question	Function	Notes
Dichotomous	Open-ended	Exogenous	22 provinces

A dichotomous classification between people who actually were born in the capital region and people that were born in the countryside.

Civil Status		What's your current situation?	
Type of data	Type of question	Function	Notes
Nominal	Closed-ended	Exogenous	4 categories; control var

The existence or not of a male partner is assumed to have a meaningful impact on family planning. The four categories are: single; married; free union and divorced.

Working status		Are you employed now?	
Type of data	Type of question	Function	Notes
Nominal	Closed-ended	Exogenous	4 categories; control var

For this key factor the 4 categories are unemployed, housewife, part-timer and full-time employee. In this context part-timer includes a sub-employed person and full-time employee refers to a worker enjoying formal employment.

Group 2. Religion Questions

Religion		Do you profess any religion?	
Type of data	Type of question	Function	Notes
Nominal	Closed-ended	Exogenous	4 categories

Given the religious demographics not only in the capital city but in the whole country the four categories include: Catholicism; Protestantism; and Atheism, due to a small

portion of the population who doesn't profess any religion. 'Other' was also included anticipating any other unusual case.

First communion	Did you celebrate the Catholic First Communion?		
Type of data	Type of question	Function	Notes
Dichotomous	Closed-ended	Exogenous	

Catholic Church teaches there are 7 sacraments believers should take part in. Among these sacraments, some are supposed to be celebrated or practiced on a regular basis such as the *Eucharist*, *Penance* or *Anointing of the Sick* whereas there are others that take place just once during the believer's lifetime such as *Baptism, Confirmation*, and ideally, *Matrimony.* The last two are considered in this research to better understand the religious posture of the respondents. It is assumed that by including into the analysis whether a respondent, identified as Catholic believer, has celebrated two of the important Catholic sacraments it is less likely to misclassify her.

Catholic marriage	Did you have a catholic marriage?		
Type of data	Type of question	Function	Notes
Dichotomous	Closed-ended	Exogenous	

This is the second of the two catholic sacraments that, along with *Religion* and *Sermons*, are considered to create a more robust, composite variable depicting the catholic faith of the respondents. A dichotomous variable (0 for not and 1 for yes). As in all the similar variables, the value of -1 is utilized during the data analysis to indicate the non-applicability of the question.

Frequency of religious sermons	How often do you listen to religious messages?		
Type of data	Type of question	Function	Notes
Ordinal	Closed-ended	Exogenous	Likert-type scale

This is about how often the respondent listen to sermons, either at church or by any media outlet. It's a close-ended question where the answer options have been limited to: never; seldom; once a month; once a week; and, more than once a week.

Group 3. Children and CMs

Number of Children		How many are alive?	
How many children have you delivered?		How many in the future?	
Type of data	Type of question	Function	Notes
Numerical	Closed-ended	Endogenous	3 different questions

The three of these questions are answered straight-forward by choosing the corresponding number between 0 and 9 and, in the hypothetical case a woman could have delivered or wished more than 9 children, the option 'more' is also included.

Opinion on spacing pregnancies	How much are in favor or against spacing kids?		
Type of data	Type of question	Function	Notes
Ordinal	Closed-ended	Endogenous	Likert-type scale

A Likert-type scale variable where the respondent chooses an option out of: really against; against; indifferent; in favor; really in favor. These options in turn, are codified during the analysis as numbers ranging from -2 to 2 since there is a real zero value here when the respondent is indifferent about spacing pregnancies.

CMs support/opposition	How much are you in favor or against CMs?		
Type of data	Type of question	Function	Notes
Ordinal	Closed-ended	Endogenous	Likert-type scale

This is a question intended to reflect the opinion and not the actual usage of the respondent. Values, as in the previous variable, can range from -2 to 2 being 0 the value for respondents who are indifferent about the CMs usage.

CMs Usage		How often do you actually employ CMs?	
Type of data	Type of question	Function	Notes
Numerical	Closed-ended	Endogenous	Percentage of use

This variable represents the actual usage and not a merely opinion or intention of usage. The possible values for this variable go on a scale from 0 to 10 according to the frequency of use of CMs.

CMs Usage before the pregnancy	Did you use CMs before the current pregnancy?		
Type of data	Type of question	Function	Notes
Dichotomous	Closed-ended	Endogenous	

This question is a double-checking tool of *CMs usage* considering the importance of the latter. As all of the dichotomous variables in the questionnaire, during the analysis it takes the 0 value for no and 1 for yes. -1 has been considered for those who didn't answer the question.

Group 4. Underlying Reasons

CMs knowledge	Which of these 7 contraceptive methods are you familiar with?		
Type of data	Type of question	Function	Notes
Dichotomous composite	Closed-ended	Input	

Options were presented to the respondents and they could check all of the modern methods they know. The options are: 1) Pills, 2) IUC, Intrauterine contraceptive. This very name doesn't appear on the Spanish version of the questionnaire but

instead, *T de cobre* which is the translation of Copper T. 3) Implant. The Spanish version shows as option Norplant, the trademark most widely used in the city, 4) Injection, 5) Condom, 6) Patch, 7) Sterilization, and 8) Other. These options are used all together to create a composite variable, through addition, to depict the level of knowledge the respondent has about CMs.

Reasons to be in favor or against CMs		Which of these 5 factors influence your opinion on CMs?	
Type of data	Type of question	Function	Notes
Dichotomous	Closed-ended	Input	Set of 6 options

This question is to know the respondents' straight opinion to compare it against both theory and empirical evidence. The included reasons are: 1) Hard to get (difficulty in access), 2) Due to religion (social norms), 3) For health (knowledge), 4) Embarrassment (another way of social norms), 5) It's abortion (knowledge), 6) Other.

Social influence	Did your parents talk to you about family planning? Does your partner agree on the use of CMs?		
Type of data	Type of question	Function	Notes
Dichotomous composite	Closed-ended	Input	2 different questions

These two questions are used to create a more robust composite variable about the influence of the society in the usage of CMs.

Cost limitation	Would you use CMs more often if they were for free?		
Type of data	Type of question	Function	Notes
Dichotomous	Closed-ended	Input	

A straight-forward question intended to find a correlation against the level of *usage of CMs* and to compare the result against the correlation between the *usage of CMs* and religious beliefs.

Church in family planning decisions	Would you use CMs more often if your church recommended them?		
Type of data	Type of question	Function	Notes
Dichotomous	Closed-ended	Input	

A final double-checking question useful to contrast the statistical correlation between the *religious composite variable* and the level of *usage of CMs*. In the hypothetical case that *religious composite variable* could significantly explain the level of *usage of CMs* this variable should have a non-negligible correlation level as well.

Appendix D

Data of the main variables used in the statistical calculations.

boleta	edad	len_maya	educacion	depto	e_civil	est_laboral	religion	religion_composite	nin_luz	nin_actual	nin_deseo	met_espaciar	met_frecuencia	saber_composite	social_composite
1	22	0	2	-1	2	1	-1		1	1	1	0	3	1	2
2	-1	0	-1	0	-1	3	-1		1	1	2	-1	10	1	2
3	32	0	3	0	1	2	-1		1	1	2	1	-1	1	3
4	27	0	5	1	3	4	-1		1	1	2	1	10	3	1
5	22	-1	-1	1	-1	-1	-1		1	1	3	0	0	0	0
6	37	0	5	1	1	4	1	11	0	0	1	1	-1	3	1
7	22	0	5	1	1	2	1	11	0	0	1	1	0	5	
8	22	0	4	1	3	2	1	10	0	0	1	2	0	2	
9	22	0	3	1	3	1	1	10	0	0	1	2	5	4	1
10	32	0	5	1	1	1	1	11	0	0	1	1	0	2	0
11	37	1	4	0	3	1	1	10	0	0	1	2	0	4	1
12	17	0	4	1	1	1	1	11	0	0	1	1	0	3	
13	17	0	5	1	1	1	1	11	0	0	1	1	-1	3	
14	27	0	5	1	3	4	1	11	0	0	1	2	10	1	2
15	37	0	4	0	1	1	1	12	0	0	2	2	0	4	1
16	17	1	4	0	1	2	1	10	0	0	2	1	-1	0	
17	32	1	5	0	1	4	1	11	0	0	2	1	8	5	
18	22	0	5	1	3	1	1	10	0	0	2	1	9	5	2
19	22	0	4	1	2	1	1	12	0	0	2	2	0	3	1
20	13	0	4	0	3	1	1	11	0	0	2	2	-1	3	2
21	17	0	4	1	3	1	1	11	0	0	2	2	-1	3	2
22	17	0	4	1	3	1	1	10	0	0	2	2	0	3	1
23	27	0	5	1	3	4	1	11	1	1	1	1	10	4	2
24	32	0	5	1	2	3	1	12	1	1	1	2	10	6	2
25	27	0	4	1	2	3	1	12	1	1	2	1	10	5	2
26	37	0	5	0	2	4	1	12	1	1	2	0	0	4	1
27	22	0	3	0	3	1	1	11	1	1	2	1	10	4	1
28	27	0	5	1	3	1	1	11	1	1	2	1	9	6	2
29	37	0	4	0	3	1	1	10	1	1	2	1	0	3	
30	27	0	4	0	2	2	1	11	1	1	2	2	5	4	
31	22	0	5	1	3	3	1	11	1	1	2	2	10	5	2
32	22	0	4	1	1	4	1	11	1	1	2	2	0	4	
33	37	0	3	0	3	1	1	11	1	1	2	2	5	2	1
34	27	0	4	1	2	1	1	12	1	1	2	2	6	4	1
35	22	0	4	0	3	1	1	10	1	1	2	1	0	4	2
36	27	0	4	0	3	4	1	11	1	1	2	1	10	1	2
37	27	0	2	0	-1	4	1	11	1	1	2	1	1	1	2
38	27	1	5	0	2	3	1	12	1	1	2	2	10	6	1
39	17	0	4	0	3	4	1	12	1	1	2	1	8	1	2
40	27	0	2	1	2	1	1	12	1	1	2	2	4	3	2
41	32	0	5	0	2	4	1	12	1	1	2	2	10	1	2

42	32	0	4	1	3	4	1	11	1	1	2	2	10	3	2
43	32	0	5	1	3	4	1	10	1	1	2	1	3	4	1
44	27	0	3	0	2	1	1	10	1	1	3	1	8	4	1
45	27	0	4	0	2	1	1	10	1	1	3	1	10	3	1
46	27	1	4	1	3	1	1	11	1	1	3	1	0	4	1
47	32	0	4	0	2	4	1	12	1	1	3	2	0	5	2
48	27	0	4	0	2	1	1	11	1	1	3	1	0	5	
49	22	0	3	1	3	1	1	10	1	1	3	2	9	4	1
50	32	0	4	1	2	1	1	11	1	1	3	2	7	3	1
51	32	0	5	1	2	4	1	12	1	1	3	2	5	3	1
52	27	0	1	1	-1	4	1	12	1	1	3	2	10	1	1
53	27	0	4	0	3	1	1	12	2	1	2	1	2	1	2
54	32	0	4	-1	2	1	1	11	2	2	0	-2	0	1	1
55	32	0	4	1	2	4	1	11	2	2	2	2	10	4	2
56	27	0	4	0	2	4	1	12	2	2	2	2	10	1	2
57	32	0	3	1	1	1	1	11	2	2	2	2	-1	4	
58	32	0	4	-1	2	1	1	12	2	2	2	2	10	2	1
59	27	0	5	0	2	1	1	12	2	2	2	2	10	6	1
60	32	0	4	0	2	4	1	11	2	2	2	1	10	1	1
61	27	0	3	0	1	4	1	10	2	2	2	-1	0	1	
62	27	0	4	1	2	2	1	12	2	2	2	2	10	2	2
63	32	0	2	-1	3	4	1	11	2	2	2	1	-1	1	1
64	27	0	5	1	2	3	1	11	2	2	2	-1	-1	6	2
65	27	0	4	0	2	1	1	12	2	2	2	2	4	2	2
66	32	0	4	-1	2	1	1	12	2	2	2	2	10	2	2
67	37	0	4	0	2	4	1	12	2	2	2	2	10	1	1
68	32	0	3	1	1	2	1	11	2	2	2	2	10	4	
69	32	0	4	0	3	3	1	10	2	2	3	2	9	5	
70	22	0	4	0	3	1	1	11	2	2	3	2	7	4	1
71	22	0	3	0	3	1	1	10	2	2	3	2	7	3	2
72	32	0	4	1	2	1	1	12	2	2	3	2	10	4	2
73	27	0	3	1	3	1	1	10	2	2	3	2	10	4	1
74	27	0	4	0	3	3	1	11	2	2	3	2	1	4	2
75	22	0	5	1	3	1	1	11	2	2	3	2	4	4	1
76	32	0	4	1	3	1	1	11	2	2	3	1	8	4	1
77	37	1	3	0	3	3	1	11	2	2	3	1	10	2	1
78	32	0	5	0	2	4	1	11	2	2	3	-1	-1	1	1
79	27	0	2	1	3	1	1	12	2	2	3	1	7	1	1
80	27	0	5	1	2	4	1	12	2	2	3	2	10	3	1
81	32	0	4	0	3	4	1	11	2	2	3	2	-1	1	1
82	37	0	2	0	3	1	1	10	2	2	3	1	10	2	1
83	22	0	2	1	2	-1	1	11	2	2	3	2	10	1	1
84	27	0	-1	0	3	4	1	11	2	2	3	2	10	1	1
85	27	0	2	1	3	4	1	11	2	2	3	2	-1	1	2
86	32	0	5	-1	3	4	1	11	2	2	3	2	10	5	1
87	22	0	4	0	1	4	1	11	2	2	4	2	10	5	2
88	32	0	5	1	2	3	1	12	3	2	2	2	10	3	1
89	32	0	5	1	2	1	1	12	3	2	2	2	10	6	1
90	32	0	4	1	3	4	1	11	3	2	4	2	5	3	2
91	27	0	2	0	2	1	1	12	3	3	3	-1	-1	1	2
92	47	0	4	0	2	4	1	12	3	3	3	-1	-1	1	1
93	32	0	2	1	1	3	1	11	3	3	3	-1	-1	1	
94	27	0	5	1	3	4	1	11	3	3	3	2	3	3	2
95	37	0	2	0	3	1	1	11	3	3	4	1	8	3	1
96	32	0	-1	0	2	1	1	12	3	3	4	2	10	4	1

97	37	0	4	0	3	1	1	11	3	3	4	2	9	4	1
98	32	0	3	1	3	1	1	11	4	4	4	1	3	1	0
99	32	0	5	1	2	4	1	12	4	4	4	1	7	1	2
100	32	0	2	1	2	4	1	10	4	4	4	2	-1	1	1
101	37	0	2	1	3	1	1	10	4	4	5	2	10	3	1
102	32	0	4	1	2	1	1	12	4	4	5	2	8	5	0
103	32	0	3	0	3	1	1	11	4	4	5	2	2	3	1
104	22	0	4	1	1	2	2	2	0	0	1	1	-1	5	2
105	17	0	4	1	3	1	2	2	0	0	1	1	0	4	2
106	17	1	3	0	1	4	2	2	0	0	1	0	0	0	
107	32	0	5	1	2	1	2	2	0	0	1	1	3	3	1
108	22	0	4	0	3	3	2	2	0	0	2	1	8	4	2
109	17	0	4	1	1	1	2	2	0	0	2	1	0	3	
110	14	0	3	1	3	1	2	2	0	0	2	1	0	3	2
111	14	0	3	1	1	1	2	2	0	0	2	2	0	0	
112	17	0	5	1	2	1	2	2	0	0	2	2	0	4	
113	17	0	5	1	2	1	2	2	0	0	2	2	0	4	
114	22	0	5	1	2	2	2	2	0	0	3	1	0	3	1
115	27	0	4	0	2	4	2	2	0	0	3	2	8	4	1
116	22	0	5	1	2	1	2	2	1	0	2	1	9	5	2
117	22	0	4	1	2	4	2	2	1	1	1	2	3	4	2
118	27	0	5	0	2	4	2	2	1	1	1	2	10	1	1
119	27	0	5	1	1	1	2	2	1	1	2	1	5	4	2
120	27	0	4	1	2	1	2	2	1	1	2	1	-1	6	2
121	22	0	4	0	2	1	2	2	1	1	2	0	9	6	1
122	27	0	3	0	3	1	2	2	1	1	2	1	8	5	1
123	22	0	4	0	2	1	2	2	1	1	2	2	10	2	1
124	32	0	3	1	2	1	2	2	1	1	2	2	0	4	1
125	27	0	5	1	1	1	2	2	1	1	2	2	9	2	
126	22	0	3	1	2	1	2	2	1	1	2	2	-1	2	1
127	32	0	5	1	3	4	2	2	1	1	2	2	10	5	3
128	37	0	5	1	2	3	2	2	1	1	2	2	10	1	2
129	22	0	5	0	2	4	2	2	1	1	2	1	-1	2	2
130	27	0	5	1	2	4	2	2	1	1	2	2	0	1	2
131	27	0	2	0	2	1	2	2	1	1	2	-1	-1	1	1
132	27	0	2	1	2	-1	2	2	1	1	2	-1	1	3	2
133	32	0	4	1	2	1	2	2	1	1	2	2	0	1	1
134	32	0	2	1	2	1	2	2	1	1	2	2	10	1	1
135	27	0	4	1	1	1	2	2	1	1	3	1	10	3	1
136	27	0	4	1	1	1	2	2	1	1	3	2	10	5	2
137	17	0	4	0	3	1	2	2	1	1	3	1	7	1	1
138	22	0	3	0	3	1	2	2	1	1	3	2	2	3	1
139	22	0	4	1	3	4	2	2	1	1	3	2	-1	1	2
140	32	0	4	0	2	1	2	2	1	1	3	2	-1	2	1
141	22	0	4	0	3	4	2	2	1	1	3	1	10	1	1
142	22	0	5	1	2	2	2	2	1	1	3	1	2	1	2
143	22	0	4	1	3	4	2	2	1	1	3	2	-1	5	1
144	27	0	-1	0	2	1	2	2	1	1	3	1	0	3	1
145	37	0	5	0	3	1	2	2	1	1	4	1	0	3	1
146	22	0	5	1	2	1	2	2	2	1	2	2	5	5	1
147	32	0	5	0	2	1	2	2	2	2	0	2	-1	1	2
148	37	0	5	0	2	4	2	2	2	2	2	1	10	1	1
149	22	0	-1	1	2	4	2	2	2	2	2	2	9	1	2
150	22	0	5	0	2	1	2	2	2	2	2	2	6	1	0
151	37	0	5	0	3	4	2	2	2	2	2	2	10	6	2

152	27	0	5	-1	2	4	2	2	2	2	2	2	9	1	2
153	22	0	4	1	3	4	2	2	2	2	2	2	10	1	2
154	37	1	2	0	2	-1	2	2	2	2	2	2	10	1	1
155	42	0	5	1	2	4	2	2	2	2	2	2	10	2	2
156	22	0	2	1	3	4	2	2	2	2	3	1	7	1	2
157	32	0	3	0	2	1	2	2	2	2	3	1	7	3	1
158	32	1	2	0	3	1	2	2	2	2	3	1	8	3	1
159	27	0	4	1	2	4	2	2	2	2	3	1	8	5	2
160	42	0	5	1	3	4	2	2	2	2	3	2	10	2	1
161	27	0	3	1	3	1	2	2	2	2	3	1	8	5	1
162	27	0	5	1	2	1	2	2	2	2	3	1	9	2	1
163	32	0	3	0	3	3	2	2	2	2	3	2	10	4	1
164	27	0	5	1	2	3	2	2	2	2	3	2	9	1	2
165	27	0	5	1	2	4	2	2	2	2	3	2	3	6	2
166	32	0	4	1	2	3	2	2	2	2	3	2	10	1	2
167	27	0	5	1	3	3	2	2	2	2	3	2	10	1	1
168	27	0	1	0	2	1	2	2	2	2	3	-1	5	1	1
169	37	0	4	1	3	4	2	2	3	1	3	2	7	2	1
170	32	0	5	1	2	4	2	2	3	3	3	2	5	3	2
171	32	0	-1	0	2	1	2	2	3	3	3	-1	-1	1	1
172	27	0	3	0	3	1	2	2	3	3	4	1	9	4	1
173	32	0	4	0	2	1	2	2	3	3	4	1	2	4	2
174	27	1	4	0	3	1	2	2	3	3	4	2	8	4	1
175	27	0	3	1	2	1	2	2	3	3	4	2	2	4	1
176	32	0	5	1	2	3	2	2	4	2	2	2	10	1	2
177	42	0	2	1	2	3	2	2	4	3	4	1	10	5	1
178	32	0	3	0	2	4	2	2	4	4	4	2	-1	5	1
179	37	0	-1	1	3	1	2	2	4	4	4	-1	-1	1	2
180	42	0	3	1	-1	1	2	2	4	4	4	2	10	1	2
181	42	0	2	1	3	4	2	2	5	5	5	1	10	1	1
182	22	0	5	1	2	1	3	3	0	0	1	2	0	5	1
183	17	0	3	1	3	1	3	3	0	0	2	1	0	1	
184	17	0	4	1	3	1	3	3	0	0	2	2	0	3	
185	22	0	4	0	3	1	3	3	1	1	2	1	3	4	2
186	22	0	2	0	1	4	3	3	1	1	2	1	9	1	
187	22	0	4	1	2	1	3	3	1	1	2	1	3	5	2
188	17	1	1	0	1	4	3	3	1	1	2	1	0	3	
189	22	0	4	0	3	1	3	3	1	1	2	2	0	4	1
190	17	0	3	1	3	1	3	3	1	1	2	2	2	1	1
191	22	0	-1	1	2	4	3	3	1	1	2	2	3	4	2
192	22	0	3	0	3	1	3	3	1	1	3	1	6	1	1
193	22	0	5	1	3	1	3	3	1	1	3	1	3	4	1
194	22	0	4	1	2	2	3	3	2	2	3	1	-1	3	1
195	22	0	4	0	2	1	3	3	2	2	3	2	8	3	1
196	27	0	5	0	1	1	3	3	2	2	3	2	8	1	2
197	22	0	4	0	3	4	3	3	3	3	3	0	6	1	1
198	27	0	5	0	3	1	3	3	3	3	4	1	7	1	0
199	37	0	3	1	3	1	3	3	5	5	6	1	8	3	1
200	22	0	4	1	2	4	4		1	1	1	0	3	1	2
201	27	0	4	1	2	1	4		1	1	3	1	10	4	1

국문초록

천주교 신앙이 과테말라 사회의 저소득층의 출생률에 미치는 영향을 측정하기

과테말라시의 국립병원 사례연구

Josué Roberto Castañeda Eguizabal

행정대학원 행정학 전공

서울대학교

세계적으로 국가의 발전 수준과 출생률의 관계를 볼 수 있다. 대개 어떤 국가가 발전할수록 출생률이 낮다. 게다가 사회적으로 인구 보충 출생률이라고 알려진 것이 최적 출생률 수준이고 이것은 국가의 적합한 지속 가능한 발전을 위해 바람직한 것이다.

적합한 출생률의 사회, 경제적인 중요성으로 인해 본서는 이것이 무엇인지, 이것의 중요성, 주요관련 요인에 대한 일반적인 고려사항을 알려주면서 시작한다. 기혼이거나 미혼이고 현재 피임의 방법을 사용하는 15-49 세 가임기 여성의 숫자인 피임율은 매우 효과적이고 널리 가능한 피임도구 만큼이나 특히 중요하다.

몇몇의 나라들의 피임율의 수준은 과테말라에서의 54%와 이웃한 중미 나라들의 평균인 79%의 대조되는 차이를 보여주며 나타난다. 그러므로 이 현상 외에도 이론에 따라 주요 근본 요인이 과테말라시에서 모아진 실증적인 자료에 반대해서 고려되고 토의되고 실험에 선택된다.

선진국에서 출생률을 촉진하는 중심으로 했던 연구와 달리 본서는 출생률을 낮추는 중심으로 한다.

본서는 천주교가 500 년 이상 동안 과테말라에 강한 미치는 영향을 고려해 다른 기존의 연구와 달리 천주교 신앙을 개인수준의 중요요인으로 고려한다. 다른 연구는 이 요인을 그냥 사회전체를 묘사하는 도구로 쓴다.

질적과 양적인 요인을 고려하는 설문지가 과테말라시 여러 국립 병원에서 임신부 200 명 이상에게 실시되었다. 종교와 또 다른 사회 경제적인 변수를 포함하는 이 모집한 자료에 의해 추가 합성변수 2 개를 구성했다: 종교 합성변수 및 사회 합성변수.

천주교와 기독교와 무교를 포함하는 범주 변수인 종교와 두개의 합성 변수 중 그 무엇도 피임율을 설명할 수 없었다. 예상외로 나이와 작업 상태가 통계적 유의도가 높은 최고의 설명변수로 밝혀졌다.

모았던 자료를 소개하고 비교하고 통계적으로 분석한 후에 인구 통계를 과테말라 국립 통계 연구원이 제공하는 공식 자료에 비해 만족스럽게

비교했다. 주요 결과를 주류 이론과 비교했다. 합리적인 이론과 양성 평등이라는 이론은 결과와 동일했다.

마침내 종교가 피임율을 설명할 수 없다는 사실이 토의되었고, 두번째로 과테말라의 시골에서 실시되는 연구의 실행이 제안되었다. 과테말라의 비교적으로 발전한 주요도시와 외진 시골 지역은 분명한 차이가 있기 때문이다.

키워드: 과테말라, 출생률, 피임율의 수준, 천주교, 피임 방법, 지속 가능한 발전.

학번: 2012-22740